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PERMIAN COALS OF EASTERN AUSTRALIA

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FOREWORD

The Permian coals of eastern Australia are a significant national resource. They cover an immense area, from Cape York to Tasmania and from the coast to far inland Queensland.

This report provides a definitive assessment of the resource and will be a standard reference for the coal industry for many years to come. In addition, it provides a wealth of detailed information on individual coal measures in terms of surface and underground geology, stratigraphy, sedimentology and structure, and chemical and physical properties.

The project has required analysis and consolidation of an enormous quantity of data from a wide range of sources. This has involved inputs from many staff and the Bureau of Mineral Resources and CSIRO are to be congratulated on the contribution they have made to the task. A great deal of information has also been provided by industry, and the relevant State Governments, and the project would have not been possible without their assistance which is gratefully acknowledged.

The project was supported by a grant of $397,271 under the Government's National Energy Research, Development and Demonstration Program. It will make a valuable contribution to the further assessment of Australia's coal resources which play such an important role in our domestic and export economies.

Peter Cook
Minister for Resources

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Abstract

An overview of the Permian coals and coal-bearing basins of eastern Australia is presented. The report is unusually large because it covers an enormous area equivalent to the Carboniferous coal basins of Europe from Scotland, through France, Germany and Poland, to the western Soviet Union.

The report contains two major data-bases (see microfiches in vol. 1). The BMR data-base covers the stratigraphy and structure of the basins between the coast and the middle of the Great Artesian Basin, and between Cape York and Tasmania. The CSIRO data-base deals with the properties of the coals in these basins. The data-bases are summarised in 42 plates (vol. 2) and dozens of line drawings showing surface and underground geology, stratigraphy, sedimentology and structure, and the chemical and petrographic properties of the coals. The illustrations are described and discussed in the text.

Three tectonic groups of basins exist: (1) small rifts and valleys with seams up to 30 m thick; (2) large interior intracratonic basins, with histories comparable to the North Sea and West Siberia Basins, e.g., the Cooper and Galilee Basins, which formed on an early Palaeozoic orogen, were filled by mainly non-marine sediments and coals (over 3 x 10^{12} tonnes, but not yet mined), and were then covered by the Mesozoic Great Artesian Basin; and (3) marginal basins, so-called because they formed near the Permian coast of Australia. In the last group, the Sydney–Bowen Basin, which contains almost all of the major black coal mines, was 1700 km long, sub-parallel to the present east coast, and was separated from the palaeo-Pacific Ocean only by a ridge in the developing Palaeozoic and Mesozoic New England–Yarrol Orogen. The basin is thought to have been a foredeep to the orogen, and was possibly also a marginal basin formed over a strike-slip fault system at the western edge of the orogen.

The interior and marginal basins have basal, middle, and upper coal measures, which are separated in the interior basins by lacustrine sediments, and in the marginal basins by marine sediments. An ice sheet, reaching its maximum in the Early Permian, extended from Antarctica to the southern quarter of Australia. Periglacial conditions occurred farther north but moved southwards as the ice waned in the late Permian, being succeeded by cold-temperate conditions resulting in the widespread upper coal measures. In the marginal basins they were deposited in prograding sedimentary environments, ranging from alluvial fan through fluvial to deltaic, but were subject to marine incursions (one eustatic), and some deformation. They also received a large volume of volcanogenic sediments from major igneous centres in the orogen. With higher and more stable palaeo-water tables, and faster deposition, the marginal basins generally have coarsely banded coals, rich in vitrinite and with high semifusinite ratios. The interior basins had lower water tables and slower deposition and tend to have finely banded coals, low in vitrinite and with low semifusinite ratios. High sulphur, as usual, is related to marine influences.

Coal rank is a matter that has received much attention, in part because of its significance in petroleum exploration. It can be correlated directly with palaeotemperatures in the basins, and indirectly with depths of burial which, in turn, were controlled by Permian tectonic events, and by several Mesozoic and Cainozoic episodes of folding, faulting and igneous activity. Some of these events were more localised than others, but the rank changes are regular and systematic.

Summary

(1) **Project objectives**

The objectives of the project were a joint BMR and CSIRO survey of the Permian coals and coal-bearing basins of eastern Australia from Cape York to Tasmania and from the mainland coast to far inland Queensland. The survey was to collate and interpret the stratigraphy, sedimentology, structure and tectonics of the basins, and the chemistry and petrography of the coals.

(2) **Work program description**

The CSIRO Fuels Geoscience Unit had existed for over 40 years and accumulated thousands of measurements of the properties of coals from many mines and drillholes in eastern Australia. For this project the data were extracted from published reports and files, and from the records and personal knowledge of individual researchers, and in the first instance were entered in a data-base. Many new measurements were made to fill gaps. The data were then plotted on maps and triangular diagrams and other line drawings after being grouped according to positions in either particular coalfields or in particular seams or other stratigraphic units. These plots were then described, summarised and interpreted.

BMR and the State Geological Surveys had worked on the coal basins for decades and published many memoirs and hundreds of other reports with maps, cross-sections, stratigraphic columns, and interpretations. The Surveys hold thousands of reports on drilling and other exploration by companies. BMR holds about 2000 massive well-completion reports on deep drillholes by exploration companies with the aid of subsidies from the Commonwealth Government. As many as possible of the data were extracted from those original sources and entered in a major data-base, which is available on tape or as a computer print-out.

The data were plotted to produce structure, contour and isopach maps for selected stratigraphic units, along with some cross-sections and correlation tables. These plots were then described and interpreted in the text.

During the National Energy Reearch, Development and Demonstration (NERD&D) Program project, the NSW Department of Mineral Resources undertook a drilling program in the Gunnedah Basin at a cost of several millions of dollars. The Department kindly agreed to the description of the results in Chapter 4 by D.S. Hamilton, J. Beckett and C.R. Weber. That chapter provides a completely new understanding of a basin with major coal resources.

The project was examined critically at intervals by monitors nominated by the National Energy Research, Development and Demonstration Council (NERDDC) (see Acknowledgements). It was also examined by company visitors who usually contributed data and interpretations.

Each year from 1980 to 1983, the work was communicated to industry in numerous papers given at meetings held by the Geological Society of Australia, by universities, and by CSIRO and BMR. Finally, the work of four years was assembled in a 10-volume report prepared for the NERD&D Program on 28 February 1984. The present, more formal publication of the original report, is an edited version thereof.

(3) **Main project results**

Each basin is described in a separate chapter with text-figures showing local stratigraphy and structure. The basin's information is tied together in an overview in Plates 1 to 42 (vol. 2). The results of the overview are as follows: All the basins were formed in either the Late Carboniferous or Early Permian and in tectonic terms can be divided into three groups. The first contains the exterior or marginal basins which are so termed because they formed close to the Early Permian coastline of Australia. Examples are the Sydney, Gunnedah and Bowen Basins, extending for at least 1700 km along the Early Permian coast. The second group consists of the large interior basins which formed in the interior of the Permian continent, exemplified by the Cooper and Galilee Basins. The third group comprises the smaller rifts and valleys; these are small in area relative to other basins but are important because they have seams up to 30 m or more thick, including some of the thickest seams of black coal in the world. Examples are the Blair Athol, Wolfang and Oaklands Basins.

The smaller rifts and valleys have each their own individual stratigraphy. There is a more general stratigraphy and a greater degree of correlation of deformational events in the two groups of larger basins. For example, the larger basins in a broad way have three sets of coal measures which may be referred to simply as the basal, middle and upper coal measures. In the marginal basins, the sets of coal measures are separated by marine beds, but in the interior basins by lacustrine and other non-marine beds. The stacks of

sediments in the marginal basins are also thicker than in the interior basins, and there are particular differences in the coal measures as described below.

In the marginal basins, the basal coal measures (where present) are dominantly fluvial, with some deltaic, lacustrine and alluvial fan sediments; overall the sequences were depositionally retrograding. In the middle coal measures, alluvial fan sedimentation is particularly prominent, but more distally there was deposition in fluvial and deltaic conditions. The upper coal measures are characterized by a general progradational trend interrupted by marine incursions; prodelta facies are succeeded by lower delta or barrier–lagoonal facies, which give way upwards to upper delta and fluvial facies, with alluvial fans a common end-member at the top of the succession.

The large intracratonic basins accumulated fluvial, deltaic and lacustrine sequences throughout the Permian. Small fault-bounded basins contain alluvial fan and braided fluvial facies derived from uplifted margins; lower-energy fluvial deposits may become more common down the palaeoslope or dominate the tops of basin fills.

The small rifts and valleys hold thin fluvio–lacustrine sequences, and those with raised peat bogs accumulated very thick coal seams. Like the clastic sediments, the coals show differences in the three groups of basins, and also vary according to age. The intracratonic basins are characterised generally by low-vitrinite, finely banded coals with a low semifusinite ratio. The marginal basins are characterised by fluvio–deltaic systems, subject to consistently high water-table in the deltaic regions, with more fluctuating conditions in the adjoining fluvial area. Coals formed within the deltaic systems are generally vitrinite-rich, with a predominance of semifusinite of the inertinites group. Coals formed in the adjacent fluvial systems show a wide range of vitrinite content with a high semifusinite ratio. The Bayswater seam interval in the Sydney and Gunnedah marginal basins overlies shallow-marine rocks, and the low semifusinite ratio suggests limited reworking of the peat, possibly with a tectonic control.

Early Permian coals are more finely banded on average than Late Permian coals, possibly because of climatically controlled changes in the peat-forming flora. Fine to very finely banded coals were formed in the intracratonic and small fault-angle basins both in the Early and Later Permian, reflecting slow subsidence rates and low biological productivity owing to low nutrient supply. In the marginal basins, lateral variations in the degree of microscopic banding may be correlated with tectonic setting in both the Early and Late Permian.

Total sulphur in the Australian Permian coals is also closely associated with depositional environment. Fluvial milieus, and particularly, braided-fluvial environments, typically contain coals with $<0.55\%$ daf total sulphur. Coals formed in lower-delta plain settings have generally between 0.55% and 1.10% daf total sulphur. Coals with $>1.0\%$ total sulphur are less common and were formed in paralic environments with access to marine sulphate either during their origin or early in diagenesis. The report has much information not only on sulphur, but also on phosphorus and other elements in the coals.

Coal rank is given considerable attention in this report and is illustrated by reflectance contour maps, which in turn have been linked with tectonic deformation. The rank can be correlated directly with palaeotemperatures in the basins and indirectly with depths of burial. These in turn have been controlled by several episodes of folding, faulting and igneous activity. Some of the tectonic events were local, but others affected most of eastern Australia and it is these that must have been significant in influencing the rank, because the rank changes are surprisingly regular and systematic. This regularity is important for the industry in planning, exploration and basic understanding.

CHAPTER 1

Introduction

by
H.J. Harrington

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Objectives of the Project

By 1978, when this project was first proposed, BMR and CSIRO had both been studying Australian coals and coal basins for over 30 years and their results are embodied in some hundreds of publications. The Fuel Geoscience Unit of CSIRO and its predecessors were involved mainly in continual laboratory investigations, particularly of the petrography and chemistry of the coals. BMR was engaged in regional geological and geophysical studies and had produced major bulletins (monographs) on several of the Permian black coal basins in eastern Australia. Both organisations worked closely with the Geological Survey of Queensland, the Geological Survey of New South Wales, and with private companies; and both hold large amounts of information which was used by the private companies. Some of that information was at first confidential, but later moved into the public domain.

The main objective of the present project was to collate and interpret as much as possible of the data from the BMR and CSIRO. The work had to be done in four years, within a budget provided by the NERD&D Program grant and by BMR and CSIRO. A grant of $405,271 was made by the Commonwealth Government under the Program. The amount expended was $397,271. There was additional expenditure from normal BMR and CSIRO funds. A 10-volume report was presented to NERDDC on 28 February, 1984.

Achievement of Objectives

The objectives were achieved; and the data obtained during the investigation are collated in the BMR and CSIRO data-bases (see microfiches). The data are shown on Plates 1 to 42 and are described and interpreted in the text and numerous text-figures in the present volume. Bibliographies are also provided in the individual chapters.

The information of the present formal publication (based on the original 10-volume report mentioned above) offers a summary of the Permian coal basins of eastern Australia from Cape York Peninsula to Tasmania (Fig. 1–1). The size of the project can be gauged by comparing the geographic distribution of the Australian coalfields with those in Europe: the distance from the Southern Coalfield in the Sydney Basin to the Collinsville Coalfield in the northern Bowen Basin is 1750 km (Fig. 1–2). It is the same distance from the coalfields of Scotland, South Wales and England, through those of France, Belgium and Germany, to the Soviet border with Poland. The Cooper, Galilee and Tasmania Basins, and lesser basins in southern New South Wales and northern Queensland, can be equated in area with coal basins in the Soviet Union.

An overview can never be final because of the size of the areas involved and because of continual exploration. During the four years of the project, many millions of dollars were spent on exploration in each of the major Permian coal basins, hundreds of kilometres of drilling were completed, billions of tonnes of coal were discovered, many hundreds of chemical and petrographic coal analyses were made, and many seismic traverses were run across the basins. In the Gunnedah Basin alone, 31 000 m of cored drilling by the New South Wales Department of Mineral Resources, supplemented by a similar amount of drilling by private companies (see Chapter 4), resulted in the discovery of hundreds of millions of tonnes of coal, and advanced our structural and stratigraphic knowledge of the basin and its coals. Such data increments occurred in all basins and it is difficult to keep up with them, especially as many were not published; nonetheless it was possible to complete this overview.

Comment on the Present Formal Publication

Except for minor changes made in the text of each chapter, and the redrafting of all text figures and some tables, the basic content of the originally submitted report "Permian coals in Eastern Australia" to NERDDC has not changed. However, the layout has been altered somewhat during adaptation to the Bureau of Mineral Resources' format. [Note that certain matters, usually taken care of when an editor is consulted early in a project, were not attended to (e.g. multiple use of identical location map), because of the time restrictions placed on issuing the present publication.] Also, the original ten volumes have been reduced to the present two, and the voluminous data-base is now presented on microfiche. The Plates have been reproduced in their original form.

Of the original data-base volumes, the one documenting the BMR CONPT Data-Base has been deleted. This volume dealt with, among other things, the structure of the data-base and software, explanations of coding forms and files created for CONPT, and application examples. Much of this information has now become obsolete, because at

Fig. 1–1. Location of coal-bearing Permian Basins of Eastern Australia.

the time of writing BMR is changing over from the old HP1000 to a Data General computer system, with attendant changes in data-base structure and software. However, brief notes on using the microfiche version of CONPT are given in Appendix A. Those who wish to access the data-base by computer should contact BMR's Information and ADP sections for the appropriate procedures.

Personnel

The application to NERDDC for a grant was made in 1978 by Dr G.H. Taylor of CSIRO and Dr A.R. Jensen of BMR. In 1979, Dr Taylor was appointed to a position in the Australian National University and Dr Jensen became an Assistant Director in BMR. Both were unable therefore to work on the project, but they supported it administratively. Mr D.S. Trail worked on the project in BMR for a few months in 1979, and Dr M.F. Middleton and Mr J.W. Hunt were appointed in CSIRO.

Dr H.J. Harrington took up appointment in BMR as project leader on 1 March 1980, and from then to completion of the report on 28 February 1984 the staffs were:

BMR: Dr H.J. Harrington (1.3.80 to 28.2.84),
Dr A.T. Brakel (10.3.80 to 28.2.84),
Mr A.T. Wells (one year '82-'83),
Mr P.E. O'Brien (one year '82-'83),
G. Waters (Technical Assistant, one year, '80–'81),
Ms S. Radke (Technical Assistant, 29.3.81 to 31.8.83),
Ms J.M. Totterdell (Technical Assistant, 13.4.81 to 31.8.83),
Mr A.T. Latter (Draftsman, 6 months, '82-'83), and
Ms S. Andrews (Drafting Assistant, 23.9.82 to 31.8.83);

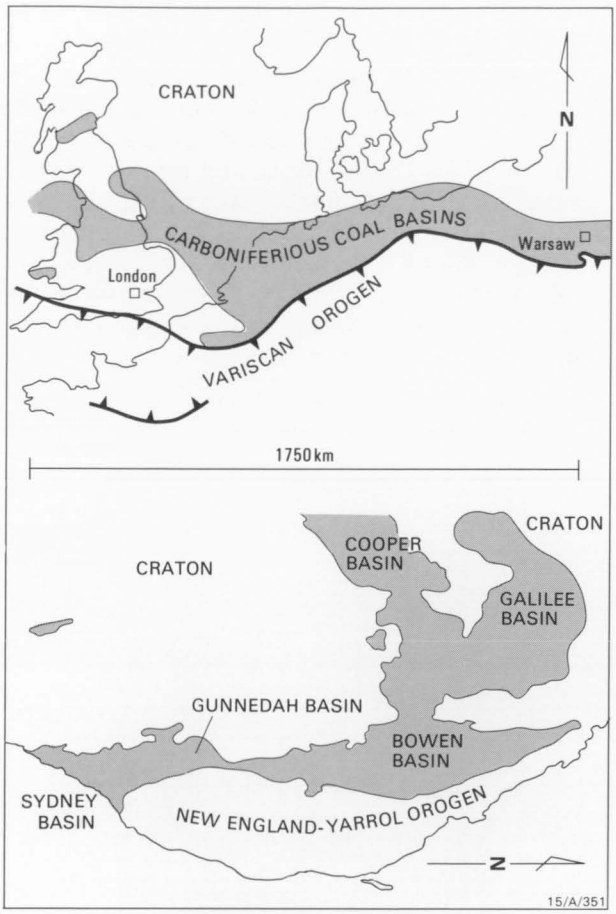

Fig. 1–2. Comparison of the size of the Carboniferous coal basins of Europe with the main Permian coal basins of eastern Australia.

CSIRO: Dr M.F. Middleton (5.10.79 to 5.10.81),
Mr J.W. Hunt (1.7.79 to 1.11.83),
Ms M. Ziekenheimer (Technical Assistant, 5.10.79 to 1.7.82), and
Ms A. Telfer (1.7.83 to 31.8.83).

Coal Research Branch, Department of Mineral Resources, New South Wales: D.S. Hamilton, J. Beckett and C.R. Weber.

Methodology

The abundance of raw data was an embarrassment (of riches) and a continuous problem. There were literally thousands of publications and thousands of unpublished reports, many of them important but available at only one place. For that reason microfiche copies were made of about 1000 reports in the NSW Department of Mineral Resources. The Geological Survey of Queensland had about 9000 reports copied on microfilm.

In the Sydney Basin, there are over 20 000 recorded drillholes. Their logs have been recorded on computer files by the Department of Mineral Resources. Hundreds of kilometres of cores from them are held in core libraries in Canberra and at Londonderry west of Sydney. The Joint Coal Board in Sydney and the Queensland Coal Board in Brisbane hold an enormous body of data gathered since Second World War. Some data are confidential for commercial reasons and, thus, were not used.

In fact, the small BMR team did not have the time to use some of the data sources and had to concentrate on hundreds of well-completion reports, on other unpublished company documents, and on State geological survey and BMR reports.

The petroleum well-completion reports are usually massive documents, produced by exploration teams, including consultants. Each report consists of up to three volumes of text, maps, sections and logs. One to three days were involved in discovering, borrowing, reading and extracting data from each report. It was recognised early in the planning of the work that about 600 to 700 well-completion and other reports could be handled in the number of working days available and it followed that the average distance between control points, established during our present study, would have to be about 25 km. In some regions, like the Dawson Folded Zone in the Bowen Basin, there can be only few control points because little petroleum or coal exploration has been done. For the same reason only widely spaced control points have been established in parts of the Cooper and Galilee Basins. In the Gunnedah Basin, quite a different situation exists because 60 coal exploration holes were drilled to basement (or close to it) in 1982 on a systematic grid of 12 by 24 km by the Coal Geology Branch of the New South Wales Department of Mineral Resources (see Chapter 4).

Seismic traverses were used, where available to supplement well records, especially in the Galilee, Cooper and Gunnedah basins, and the Denison and Taroom troughs.

The CSIRO data is partly based on new measurements and partly on published and unpublished reports and files of the Division of Fossil Fuels and its predecessors.

In general, many control points used by BMR (see microfiches 1–6) do not correspond with those used by CSIRO (see microfiches 7–8), for a reason that was unexpected when the project began. This was that BMR used as control points, where possible, major deep *petroleum wells* from which cores and cuttings had been lodged in one of the core storage facilities (core libraries) maintained by BMR and State agencies. These wells were used because they gave the best intersections of basin stratigraphic sequences. It was found, however, that few coal samples from those wells had survived, for a variety of reasons. In contrast, the CSIRO team needed coal samples and, therefore, had to turn to mines and to coal *exploration holes*

where there had been an emphasis on the coring and preservation of coal samples. Those holes are naturally concentrated in districts where the coals are at shallow workable depths, many of them in quite different areas from the petroleum holes.

A considerable effort was put into the bibliographies for each of the main chapters. With staff changes, with part of the team in Canberra and part in Sydney, and with time constraints, it proved impractical and undesirable to present one consolidated bibliography in hard-copy form (as requested by NERDDC). However, a single bibliography is available on floppy discs and can be provided on request.

The chief result of the project is, as was intended, the set of maps and sections of Plates 1 to 42. These plates were constructed mainly from the BMR and CSIRO data-bases, and most were compiled at a scale of 1:1 000 000, but are presented at 1:2 500 000, so that the whole of Eastern Australia could be shown on one sheet. For professional readers, the plates provide a summary of the project, especially when supplemented by the numerous line drawings in the text.

CHAPTER 2

Acknowledgments

The study was supported by a grant under the National Energy Research Development and Demonstration Program to CSIRO (the contract organisation) and BMR.

In both CSIRO and BMR, major changes took place in their organisational structure during the course of the project. In CSIRO, the Fuel Geoscience Unit was incorporated in the new Division of Fossil Fuels, and new divisions were formed in BMR. The project was given essential administrative support by Mr J.N. Casey and Dr. A.R. Jensen in BMR, and later also by Dr P.J. Cook. In CSIRO, support was given by Dr M. Shiboaka and others.

The project was periodically monitored for NERDDC by Mr G. Rose, Secretary of the New South Wales Department of Mineral Resources, by Dr C.T. McElroy of McElroy, Bryan and Associates Pty Ltd, and by the late Dr C.E.B. Conybeare of the Australian National University. They helped with reviews and support.

Mr A.J. Barlow and Ms E. Anderson of the ADP Section of BMR gave continued and invaluable help with the recording of the data-base and with computer-assisted drafting problems.

Mr C. Modrak of the Stratigraphic Index Section of BMR and Mr G. Waters, gave similar invaluable assistance with the initial compilation of bibliographies.

Mrs E. Nicholas had been a co-author of BMR Bulletin 149 on the Sydney Basin and helped by supplying drawings that had survived from that work.

Dr J.M. Dickins is the BMR palaeontologist who had the greatest association with the biostratigraphy of the Permian basins, especially the Bowen and Sydney Basins and their respective bulletins; he was always available to discuss stratigraphical problems and accompanied us on field work on a number of occasions.

Dr A.R. Jensen had worked for years in the Bowen Basin, spent two weeks in the field with Drs Harrington and Brakel, and was a consistent supporter administratively, particularly with problems caused by turnover of staff.

Similarly, Mr J.N. Casey ascertained that we had administrative support, and he also visited exploration sites in the Galilee Basin with us.

Dr G. Wilford read the drafts of some chapters.

From the CSIRO, M. Shibaoka initiated and advised on several topics; Michelle Smyth provided supervision, guidance and stimulating discussion on petrographic matters and access to the CSIRO petrographic data base; and J. Smith analysed samples and provided guidance in the interpretation of sulphur isotopic data. M. Sheldon, C. Brown, J.Ledsam and M. Ziekenheimer provided technical assistance at various times during the project. Other colleagues who assisted in various ways were: A. Telfer: petrographic analyses and report compilation; N. Russell: discussion and report scrutineering; A. Bennett: discussion, access to unpublished data and report scrutineering; R. Botz: discussion and scrutineering; D.J. Swaine, N. Morgan and colleagues: trace element analyses; G. Hansen and colleagues: sample preparation; E. Murray and L. Brunckhorst: petrographic preparations; N. Watson and colleagues: chemical analyses; A. Martinez and S. Goadby: ash analyses; R. Quezada and R. Cosstick: low-temperature ashing; A. Horne: X-ray diffraction; J. Corcoran: SEM analyses; L. Brunckhorst and K. Kinealy: electron-microprobe analyses; and C. Mallett (Div Applied Geomechanics) with discussion.

Many personnel of the State Geological surveys, Joint Coal Board, several universities and other organisations provided access to and preparation of samples, as well as stimulating discussion of geological matters. During the first 18 months of the project, there was a major boom in coal exploration, development and mining, and geologists and administrators connected with the industry were working under pressure, but all who were asked gave generous help, including the following of the *N.S.W. Department of Mineral Resources*: G. Rose, J. Cramsie, Jenny Thompson, A. McMinn, G. Bradley, V. Scheibnerova, J. Maloney, J. Whitehouse, H. Bowman, D. Thompson, J. Mirlahe, and L. Childs: *Geological Survey of Queensland*: R. Allen, C.B. Foster, J.J. Draper, V. Palmieri, G. Fleming, G. Mengel, J. Beeston, P. Holmes, R. Staines, and R. Smith; *University of Newcastle*: C.F.K. Diessel, B.A.R. Engel, K.H.R. Moelle, S.St.J. Warne, P. Warbrooke; *Geological Survey of South Australia*: C.D. Branch, C. Gatehouse, and D. Gravestock; *Bridge Oil*: K.G. Smith: *Offshore Oil*

N.L.: C. Herbert; *University of New South Wales*: I.R. Qureshi; *Robertson Research (Aust.) Pty Ltd.*: C.S. Bembrick; *Joint Coal Board*: R.A. Britten and W.O. Morris, R. Banerjee and K. Brown; *AAR Ltd.*: P.L. Price; *Broken Hill Pty Co. Ltd.*, Newcastle: G. Harman; *BMI Mining*: G. Brech; *Esso Australia Ltd.*: S. Wilcock: *Muswellbrook Coal Co. Pty. Ltd.*: J. Rogis; *Electricity Commission of New South Wales*: C.E. Crapp; *Metropolitan Water, Sewerage and Drainage Board*: N. Grey; *Macquarie University*: P. Conaghan, G. Jones, K. McDonald, P. Hunt, R. Beaujolais, and P. Linney; *Sydney University*: M. Lennox; *N.S.W. Institute of Technology*: C. Ward; *Purdue University (U.S.A.)*: G. Kullerud; and *Wollongong University*: A. Hutton.

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Mrs Karen Somerville and Ms Jane Newbery (contract draft persons) (redrafting of all text-figures and some tables) — drafting supervision and cartographic editing was carried out by Mr Martyn Moffat, Supervising Draftsman, Division of Continental Geology, BMR;

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CHAPTER 3

Sydney Basin: Permian Coal Measures — Stratigraphy and Sedimentation

by
A.T. Brakel

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Introduction

The Sydney Basin is by far the greatest producer of coal in New South Wales, and is also the greatest producer of black coal (for domestic use plus export) in Australia. Its reserves of black coal are estimated at about 378 billion tonnes. The basin lies at the southern end of the Sydney–Bowen meridional trough, and occupies a roughly triangular area stretching inland northwesterly from the New South Wales coast (Fig. 3–1). Eastwards it extends onto the continental shelf, presumably to the shelf edge. Before the opening of the Tasman Sea by rifting in the Mesozoic, the basin possibly extended onto what is now the Lord Howe Rise (Carey, 1969). Onshore, the western boundary of the basin is an erosional one at the present limit of Permian outcrop, while the northeastern boundary is largely formed by the Hunter Thrust. The Cranky Corner Basin, a small structural basin with Permian rocks, including currently mined coal measures, occurs north of Branxton as an outlier north of the Hunter Thrust. Near Newcastle, the basin boundary is formed by the erosional limit of the Permian System, which here is probably paraconformable on slightly older Carboniferous rocks. The boundary has been traced out to sea by using sparker profiling (see Fig. 3–3). Bembrick & others (1973) defined on structural grounds a boundary with the Gunnedah Basin to the northwest along the Mount Coricudgy Anticline. Recent drilling by the NSW Department of Mineral Resources in the Gunnedah Basin has suggested that this anticline may not have the importance formerly ascribed to it, and that the sequence of the western Sydney Basin can be recognized as far north as Coolah. A more meaningful boundary may be placed in future on the north side of the

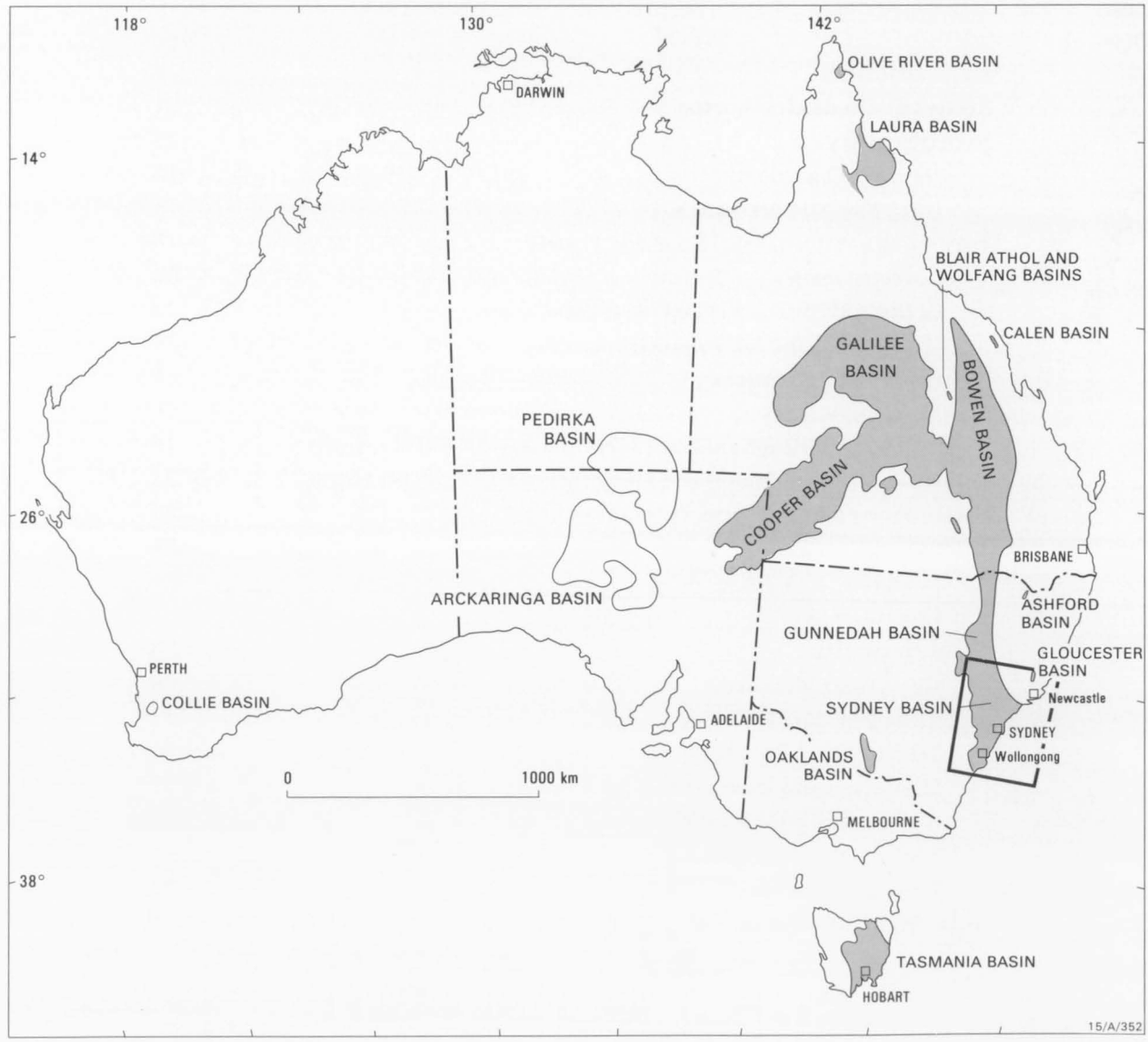

Fig. 3–1. Location of the Sydney Basin.

Liverpool Range. Certainly, such a boundary is more convenient and is used in this chapter, because the Late Permian coal measures stratigraphy of the upper Hunter area extends without interruption westward into the Goulburn River valley.

For the purposes of coal mining, the Sydney Basin has been divided into the Northern, Western, Central, Southern, Southwestern and Clyde River Coalfields (see Stuntz, 1975a; fig. 2). These divisions are used here, except that the last three are grouped into one Southern division (Fig. 3–2). In the data-base, they are designated respectively as North, West, Central, and South Sydney Basin.

The basin has a long history of geological investigation. Coal was discovered at Newcastle and Coalcliff within a decade of European settlement at Sydney, and mining began shortly thereafter. Over 20,000 bores have been drilled, most of which are coal exploration and reserve assessment bores around the basin margins, where the Permian coal measures are at the surface or at minable depths below Triassic cover. In the central region of the basin, drilling has been sparse, and has consisted mostly of rotary drilling for petroleum exploration.

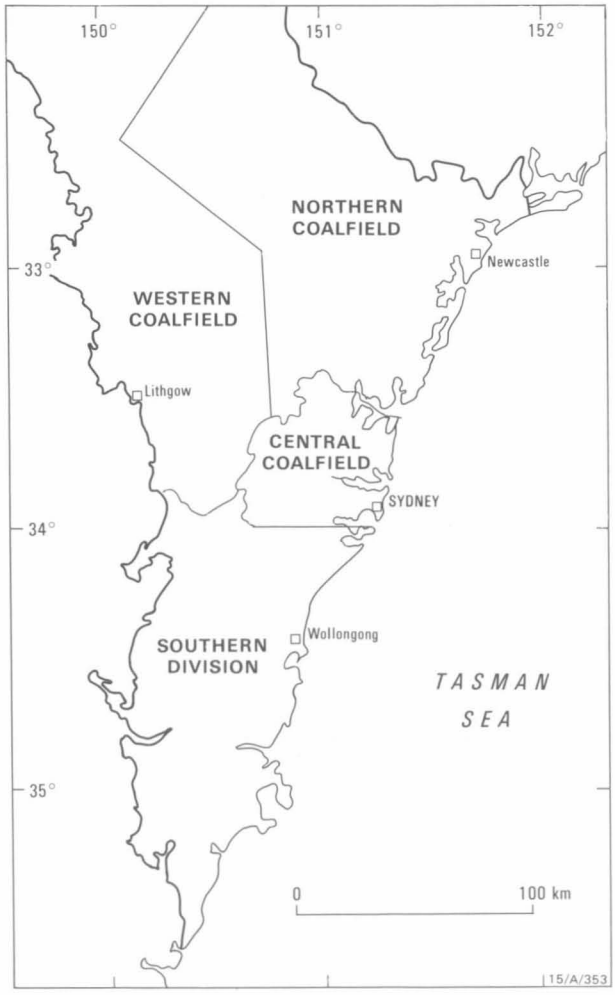

Fig. 3–2. Sydney Basin district subdivision as used in this report, based on coalfields.

Structural Subdivisions

A division of the Sydney Basin into structural elements has been provided by Bembrick & others (1973). Many of these units are morphologial in nature (e.g., Hornsby Plateau), reflecting the effects of Cainozoic uplifts, but for the purposes of the present study a more suitable subdivision is one based on the structures as they existed during the deposition of the Late Permian coal measures, presented in Fig. 3–3.

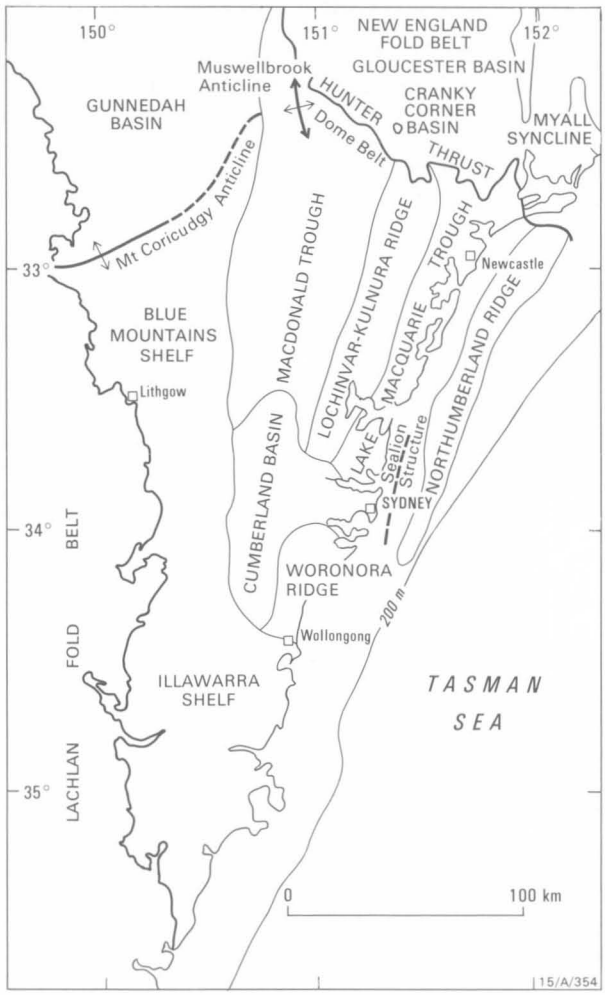

Fig. 3–3. Sydney Basin structural elements.

The basin consists of two dominant structural features: a western shelf which extends along the western margin and includes the southern extremity of the basin, and a trough-and-ridge region occupying the rest of the basin.

The shelf region consists of the Blue Mountain Shelf and Illawarra Shelf, with no sharp boundary between them. It is separated from the rest of the basin by a line of faults and monoclines, including the Lapstone Monocline, Kurrajong Fault, Nepean Fault, and Nepean Monocline. In the Hunter

Valley area, this boundary is marked by a meridional fault near Mt Ogilvie (Stuntz, 1972b) which is connected with the Lapstone Monocline to the south by a lineament visible on Landsat imagery. The boundary between the western shelf and the rest of the basin probably reflects movements on a major pre-existing fault in the basement (Harrington & Brakel, 1981).

The trough-and-ridge region is essentially a large trough broken up by meridional ridges. The largest trough, referred to as the Macdonald Trough (the Macdonald Depression of Mayne & others, 1974), occupies the north-central area of the basin and is separated by the Lochinvar–Kulnura Ridge from the Lake Macquarie Trough to the east (the Macquarie Depression of Mayne & others, 1974; here amended to prevent confusion with the more local Macquarie Syncline of the Newcastle district). Offshore from the Lake Macquarie Trough is another, previously unnamed, meridional ridge discovered by seismic work (T. Russell, Sydney Oil Co., pers. comm.), here named the Northumberland Ridge after the County of Northumberland. This ridge was probably the site of contemporaneous volcanism which supplied tuffs to the Newcastle Coal Measures, and was also the source of the alluvial fans within the Newcastle sequence. Eastwards of the ridge there is presumably another trough. In the Sydney area, the Macdonald and Lake Macquarie Troughs meet in a depression known as the Cumberland Sub-basin. South of Sydney, a spur (here called the Woronora Ridge) appears on trend with the Lochinvar–Kulnura Ridge on the other side of the Cumberland Sub-basin.

Many lesser structures also exist. One of these is the Sealion Structure, an anticline just offshore from Sydney. In the Hunter Valley, in what has been called the "Dome Belt", there are several domes and anticlines, the largest being the Lochinvar and Muswellbrook Anticlines which were active during deposition of the Late Permian coal measures, as evidenced by a local unconformity within the Tomago Coal Measures at the Buchanan tunnel on the eastern flank of the Lochinvar Anticline (Blayden, 1971), and contrariwise thickening of the lower and upper Wittingham Coal Measures in the Muswellbrook district (Stuntz, 1972b).

Stratigraphy

The stratigraphy of the Sydney Basin has been described and reviewed in a great many publications, of which the most notable are those by Packham (1969), Mayne & others (1974), Branagan & others (1976), and Herbert & Helby (1980). Important reviews which emphasize the coal measure sequences are given by Menzies (1974), Traves & King (1975), and Robinson & Shiels (1975). To these may be added Bembrick (1983), who defined the detailed stratigraphy of the Illawarra Coal Measures in the Western Coalfield, and Wells (1981), who supplied a concise resume of the coal measures.

Figure 3–4 shows the generalized stratigraphy of the different regions of the basin. The fact that the Sydney Basin succession is so well known, in conjunction with an extensive literature, makes it unnecessary here to discuss the stratigraphy in the same detail as for the less widely known basins

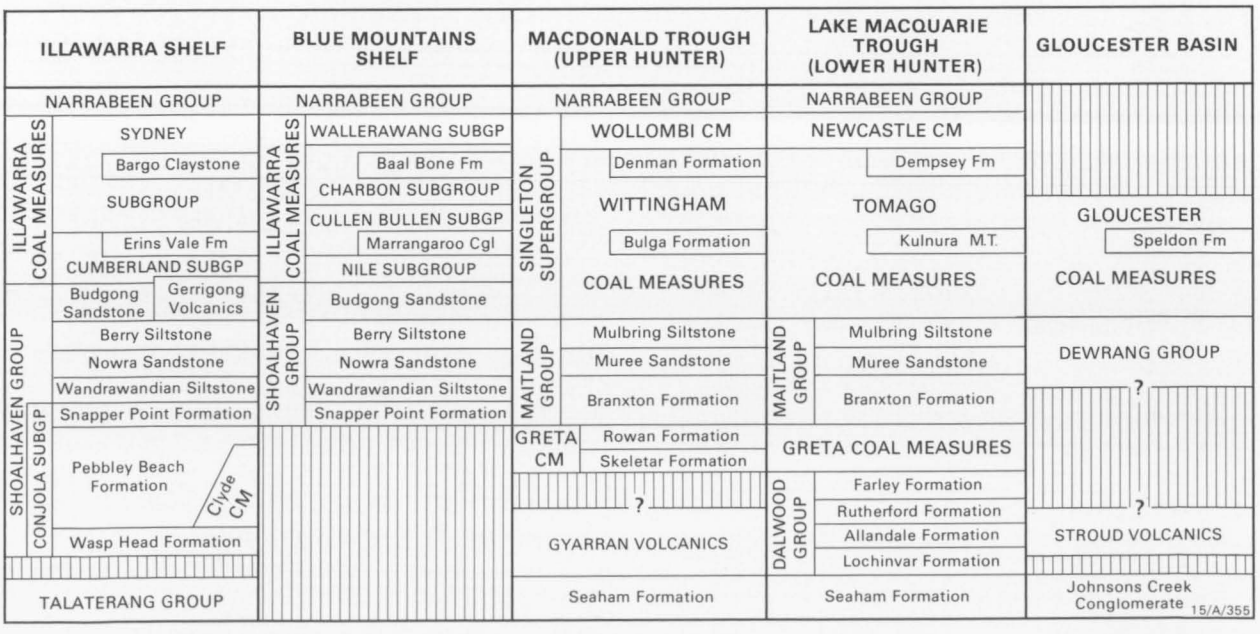

Fig. 3–4. Tabulation of stratigraphic nomenclature in the Sydney Basin. Thickness and time duration of units are not to scale, and detailed facies relationships are not shown. M.T. = marine tongue.

dealt with in this publication. Broadly, the Sydney Basin sequence records a rapid Early Permian transgression initiating marine conditions throughout most of the basin for the greater part of the Permian, followed in the Late Permian by a regression which allowed the basin-wide deposition of coal measures. The marine portion is called the Shoalhaven Group in the southern, central and western regions, and the overlying non-marine portion is variously referred to in different areas as the Illawarra Coal Measures, Singleton Supergroup, and Tomago Coal Measures/Newcastle Coal Measures. The Tomago and Newcastle equivalents within the Singleton Supergroup are called, respectively, the Wittingham and Wollombi Coal Measures. The most important departure from this general trend occurred in the Northern Coalfield in the mid-Permian, when a temporary regression saw the deposition of the Greta Coal Measures. The marine sections below and above the Greta are known as the Dalwood and Maitland Groups, respectively. At the base of the Dalwood Group north of Newcastle is a coal occurrence known as Garretts seam, the oldest Permian coal in the Sydney Basin (David, 1907).

The Dalwood Group has a substantial amount of basalt and tuff, and in the Upper Hunter area the equivalent unit, the Gyarran Volcanics, contains no marine sediments at all. The volcanics extend southwards in the subsurface along the Lapstone Monocline to the AOG Kirkham 1 well (Mayne & others, 1974). Gravity anomalies suggest that the volcanics are at least 8.6 km thick (Qureshi, 1984), implying the presence of an Early Permian rift along and east of the Lapstone hinge line (H.J. Harrington, pers. comm.).

Nature of the Basement

The basement rocks below the Blue Mountains and Illawarra Shelves consist of metamorphics, volcanics and granites of the Lachlan Fold Belt. Below the Hunter Valley, the basement is an extension southwards of the New England Fold Belt, which is exposed in the Mt Bright Inlier near Pokolbin as Late Carboniferous Seaham Formation and "Kuttung" volcanics overlying Early Carboniferous granodiorite (Brakel, 1972a). Petrographic studies on Seaham Formation conglomerates north of the Hunter Thrust show that the basement to the south comprises rocks similar to those in the Mt. Bright Inlier, as well as older Palaeozoic sediments (usually hornfelsed by the Early Carboniferous plutons) and a still older block of blastomylonitic gneiss (Brakel, 1981). Farther south, in the eastern and central Sydney Basin, the nature of the basement is uncertain. Xenoliths of granite, quartz–feldspar porphyry, quartzite, rhyolite and trachytic basalt within diatremes (Crawford & others, 1980) suggest that the basement could be Lachlan Fold Belt terrane, assuming that the xenoliths are not derived from glacial erratics in the Shoalhaven Group. The nature of this basement is crucial in working out the tectonic origins of the basin, and in testing hypotheses such as that by Harrington (1982), that the Lapstone depositional hinge line is over a major strike-slip fault zone in the basement, along which the New England Fold Belt slid past the eastern side of the Lachlan Fold Belt. Also important for the same reason is the age of the Rylstone Tuff, east of Mudgee. Although usually regarded as Carboniferous, this unit is undated palaeontologically and isotopically. At two localities, it has small occurrences of altered basalt at its top (Evans, 1968), suggesting the possibility that the unit may represent bimodal volcanism, equivalent to the Early Permian Boggabri Volcanics.

Intra-Basinal Correlation

Basin-wide correlation of units, by dividing the Sydney Basin sequence into broadly coeval intervals, was attempted by Mayne & others (1974). This was revised by Herbert (1980a), and can now be further revised as a result of palaeontological work by J.M. Dickins, which shows that the Snapper Point Formation is not time-equivalent to the Greta Coal Measures as previously thought, but is younger and equivalent to the lower portion of the Branxton Formation (Fig. 3–4).

The Clyde and Yarrunga Coal Measures, and other coal-bearing lenses in the same region, appear to have been deposited mostly on the basal unconformity at various times ahead of the transgressing Shoalhaven Group. The palynological ages range from lower stage 3 (middle Dalwood Group) to Stage 4 (Greta Coal Measures) (Herbert, 1980b).

Within the upper coal measures, two marine to brackish units can be correlated across the basin. The lower of these is the Kulnura Marine Tongue within the Tomago Coal Measures and its equivalents. It is dominantly fine-grained with abundant burrowing and bioturbation, and some shelly fossils. In the southern Sydney Basin it is equivalent to part of the Erins Vale Formation (Bunny, 1972). The marine interval also reaches the surface in the Hunter Valley as the Archerfield and Bulga Formations, and palynology (McMinn, 1982a) shows that the marine rocks at the bottom of the Stockton 3 bore, north of Newcastle, are at a similar stratigraphic level. Bailey (1983) proposed the "Broke Formation" for the upper Hunter region, to include the Archerfield and Bulga as members. It is suggested here that because the Kulnura Marine Tongue can now be recognized unambiguously over most of the Sydney Basin, and is such an important marker unit, it should be elevated to formation status and be known in all

areas as Kulnura Formation. Thus, the proposed "Broke Formation" should be known instead as Kulnura Formation.

The Kulnura underlies in many areas a coal seam with a distinctly dull petrographic profile through all or part of its thickness. This is the Bayswater Coal Member in the upper Hunter and the Woonona Coal Member in the south. There is no equivalent dull coal in the Newcastle district, and in the central basin the seam in this position usually has a normal vitrinite content, although in Dural South 1 (Hunt & others, 1984b) the seam has a lower vitrinite content which may represent a transition to Bayswater seam facies. The equivalents of the Bayswater Coal Member are readily recognized in the Western Coalfield by their petrographic profiles as the Ulan and Lithgow seams. These seams overlie the Marrangaroo Conglomerate instead of the Kulnura Marine Tongue, thereby indicating the stratigraphic equivalence of the two units. The relationship of these two units and its significance is discussed in Chapter 17.

The second widespread marine to brackish unit in the upper coal measures is the Dempsey Formation and its equivalents, the Denman Formation (upper Hunter), Baal Bone Formation (Western Coalfield), and the Bargo Claystone (southern division). The interval is characterized by predominantly fine-grained sediments, in which burrowing and bioturbation are common in many areas. No shelly fossils are known, but foraminifers (Scheibnerova, 1980) and acritarchs (McMinn, 1982b) have been found. The Bargo Claystone has previously been interpreted as a fluvial flood-plain deposit (Bunny, 1972; Bowman, 1980), but the present writer has observed in its Austinmer Sandstone Member at Bells Point a burrowed and bioturbated bed only 1 m above the Tongarra Coal, and probable bioturbation higher in the section, suggesting possible estuarine influence. The Dempsey interval can be recognized also by its position under a sandstone marker, the Waratah Sandstone and its equivalents. The Waratah Sandstone (Newcastle district) has been correlated with the Watts Sandstone (upper Hunter) (Britten, 1972a), the Angus Place Sandstone (Western Coalfield) (Bembrick, 1983), and the Darkes Forest Sandstone (southern division) (Stuntz, 1972a).

The top of the upper coal measures is usually taken as the top of the highest coal seam, but the highest coal seams in the various regions are not necessarily equivalent. For example, in the southern region of the basin, part of the coal measures have been eroded away locally by the fluvial systems which deposited the Triassic Narrabeen Group and Hawkesbury Sandstone. On the southern nose of the Lochinvar Anticline, the coal measures have also been eroded in part (David, 1907; Brakel, 1972a) or wholly (McIntosh, 1968). The top of the Newcastle Coal Measures has conventionally (and arbitrarily) been taken as the top of the Wallarah seam, but there is a higher seam, the Vales Point Coal Member, and palynology (Balme, 1969) shows that the intervening sediments are Permian. A proposal by Ziolkowski (1978) that the top of the Newcastle Coal Measures be redefined as the top of the Vales Point seam, therefore, has merit.

Environment and Palaeogeography

At the beginning of the Permian period, the Sydney Basin did not exist as a structural entity. To the north, the Late Carboniferous Seaham Formation had been deposited in northeasterly draining fluvial and lacustrine environments, in a cold climate in which ice-rafting, and possibly valley glaciers, existed (Brakel, 1972b). In the south, the Talaterang Group was being deposited by easterly flowing streams in deeply incised valleys which had probably been formed by glacial activity (Herbert, 1972). Elsewhere along the present western basin margin, an erosional regime prevailed on land composed of older Palaeozoic rocks.

Disconformity or low-angle unconformity between the Late Carboniferous sediments and the overlying Permian has been observed in many places. Herbert (1972) has noted it in the southern Sydney Basin. Brown & Dun (1924) observed it at Lochinvar, and Osborne (1950) reported overlapping relationships in the Mindaribba Syncline near Paterson. In the northern Cranky Corner Basin, an unconformity was described by Walkom (1913), and elsewhere in this basin the sections measured by Brakel (1972b) and Slee (1968) show differing lithologies at the base of the Permian within short distances, suggesting possible disconformity. A major unconformity at about this level has been reported from the Werrie Basin (Whetten, 1965; Korsch & Harrington, 1981), although McPhie (1982) found only local disconformable onlap. There appear to be no proved cases of conformity between the Carboniferous and Permian systems in the Sydney Basin region. Garretts seam north of Raymond Terrace is conformable with the underlying sediments, but the placement of the base of the Permian at the base of this coal is arbitrary, and the boundary could just as well be lower in the sequence. The possibility must, therefore, be considered that the boundary between the two systems in the Sydney Basin is everywhere a disconformity or low-angle unconformity. This could be attributed to tectonic movements, which also allowed the Early Permian sea to progressively transgress over the area of the present Sydney Basin, and the eastern half of the New England Fold Belt.

The tectonism also led to the formation of a volcanic rift with bimodal volcanism (the Ayr Volcanic Rift of Scheibner, 1974), which extended from west of Sydney, northwards through the Macdonald Trough, Gunnedah Basin and Bowen Basin, to the Townsville area of north Queensland.

Garretts Seam

The oldest coal in the Sydney Basin, about 25 km north of Newcastle, is accompanied by tuff (David, 1907), presumably derived from eruptions in the volcanic rift to the west. The palaeo-environmental setting of the seam and the enclosing sediments has not been studied, but they would have been laid down as a freshwater sequence before the Early Permian marine transgression reached this locality.

Clyde and Yarrunga Coal Measures

As the transgression gradually took place in the southern Sydney Basin, the Clyde and Yarrunga Coal Measures, and the other coal-bearing lenses in the region, were deposited in the paralic zone at various times as the zone moved slowly westwards (Herbert, 1980b). These coals are therefore not time equivalents. Evans & others (1983) envisage a fan delta complex for the interval between the basal unconformity and the Nowra Sandstone, with the coal measure lenses being deposited in marshes behind fringing barrier bars. The delta was centred at or near Yadboro, and spread eastwards to merge with the rising sea, which eventually drowned it.

Shoalhaven and Dalwood Groups

During the marine transgression, a thick unit of sand and silt accumulated on the open marine shelf so formed. Conditions varied from quiet-water offshore to higher-energy intertidal flat, lagoonal, and very turbulent littoral regimes. A cold climate prevailed, with floating ice bringing in rafted rock fragments, which upon release become "dropstones" in the sediments. In the lower Hunter Valley area, island volcanoes erupted thick basaltic lava, and shed debris into the surrounding sea. Father west, volcanic deposition remained subaerial throughout this interval.

Greta Coal Measures

The Great Coal Measures, deposited only in the northern Sydney Basin (and as the equivalent Leard and Maules Creek Formations in the Gunnedah Basin), form a non-marine wedge of sediment derived from a tectonically active hinterland to the north. In the Maitland–Singleton region, the sequence is dominated by alluvial fan conglomerates and sandstones. Around the Lochinvar Anticline, conglomerate lenses split the coal seams (Britten, 1975a), the direction of the lines of splitting suggesting a north–south palaeocurrent. Brakel (1967) observed a local palaeocurrent direction from the northeast quadrant, and McIntosh (1968) has reported a wide range of such directions from the northwest and northeast quadrants, but dominated by a west to northwest component. The composition of the conglomerate clasts, and the decrease in clast size towards the south, confirm a northerly source. The high proportion of pyrite near the top of the Greta seam suggests that at this level marine influence was laterally or vertically close by. The coal appears to have been deposited in the interfan areas and as raised peat bogs on the surfaces of the fans.

In the Cranky Corner Basin outlier, the Greta Coal Measures sequence has three coal seams and consists predominantly of sandstone with conglomerate phases, presumably laid down in similar environment.

The Greta Coal Measures are finer grained and dominantly fluvial in the Muswellbrook Anticline, but the Ayrdale Sandstone Member of the Rowan Formation has rare organic burrows, and some lenticular and flaser bedding, possibly suggestive of tidal influence. The increasing proportion of coarse clastics northwards towards the bounding Hunter Thrust System is consistent with the Muswellbrook area having been located down dip from alluvial fans. The Skeletar Formation, underlying the Rowan Formation, consists of porcellaneous and volcaniclastic rocks, some extensively kaolinized to flint clay, and devoid of economic coal. A pelletoidal texture is common, with pellet sizes ranging from fine sand to granules. Upward-fining cycles and imbrication (Diessel, 1982), and the absence of marine fossils, indicate fluvial deposition of the clay pellets or their precursors. The unit is equivalent to the Leard Formation of the Gunnedah Basin (Brownlow, 1980), and may record a period of intense weathering and erosion of the underlying volcanics, at a time when marine conditions prevailed elsewhere in the Hunter Valley region, where there is no flint clay unit at the base of the Greta Coal Measures.

The regional setting of the coal measures, therefore, was that of a series of alluvial fans, which in the lower to middle Hunter region built out into the sea as fan–deltas, while to the northwest they graded distally to alluvial plains flanking the sea. Likely sub-environments include interfan areas,

salt marshes behind fringing barrier bars, raised peat bogs on fan surfaces, and fluvial floodbasins. Coal seams split away from the crestal zones of the major anticlines, implying that these structures had already started to form and that there was more rapid subsidence in the trough zones (Britten & others, 1975). Coalification studies also show that the Lochinvar Anticline was active as early as Greta Coal Measures time (Diessel, 1975). Initially, the sediment wedge prograded over marine deposits in the east, and over volcanics, and detritus derived from them, in the west. Later, rising sea level gradually submerged the coal-forming area, first in the Sydney Basin, and subsequently in the Gunnedah Basin farther northwest. The climate during Greta time was cool, because there is evidence of continued ice-rafting in the marine southern Sydney Basin. The ice crystal casts recorded by Tobin (1980) from the Ayrdale Sandstone Member show that in the Muswellbrook area the temperature dropped below freezing point on at least some occasions.

Maitland Group

The rising sea level not only ended coal measure deposition in the north of the basin, it also resulted in transgression over pre-Permian basement along the western margin. A sample collected from 7 m above the basal unconformity at Windy Gap, 45 km south-southwest of Mudgee, was analyzed by McMinn (1982c) and found to contain an upper Stage 4 microfloral assemblage, equivalent to the Branxton Formation (north) and Wandrawandian Siltstone (south). The Branxton Formation records a renewed cooling of the climate, resulting in a return to extensive ice-rafting, and probably valley glacation, in the northern basin. The cold climate persisted at least until the end of Maitland Group time. The open marine shelf deposits of the Branxton–Wandrawandian interval were blanketted by near-shore sands of the Muree and Nowra Sandstone, after a regressive–transgressive episode (Herbert, 1980a). A hiatus in the sedimentary record was left at the base of the Nowra Sandstone (McKelvey & others, 1971), and possibly at the base of the Muree. The regression and resulting hiatus appears to have been caused by tectonic activity in the adjacent New England Fold Belt. The sands were in turn succeeded by the offshore silts of the Mulbring and Berry Siltstones.

Morris (1982) reported wedges of coal measures sediments within what he interpreted as the Branxton and Mulbring Formations. They were intersected in bores drilled northeast of Muswellbrook by the Muswellbrook Coal Company, and one of the wedges in the interpreted Mulbring has eight coal seams (W. Morris, pers. comm.). The terrestrial wedges imply that the area lay near a hinge line, to the north of which intermittent uplifts caused detritus to be eroded away, transported southwards, and deposited in prograding shoreline lobes.

Tomago, Wittingham and Lower Illawarra Coal Measures

Continuing uplift and volcanism in the New England region stimulated vigorous erosion of the highlands, while rapid subsidence in the neighbouring Sydney Basin caused the transport of the resulting sediment southwestwards across the axis of the basin, with only minor amounts of sediment being introduced at times from the more stable Lachlan Fold Belt to the southwest (Herbert, 1980a). The sedimentary wedge that was deposited consequently displays a long-term progradational trend, with a succession of facies progressing from prodelta to lower delta plain, upper delta plain, and fluvial. The general trend was, however, punctuated by marine incursions, the effect of which on sedimentation was to produce temporary reversals of the long-term trend, and short-lived repetitions of earlier, more distal environments. The lower part of the prograding wedge comprises the Tomago Coal Measures and equivalents, laid down predominantly in a deltaic environment.

Tomago Coal Measures

The base of the Tomago Coal Measures is a very gradual transition from prodelta marine to lower delta plain deposition. The basal unit, the Mount Vincent Formation, has its top truncated by an angular unconformity which is only locally developed along the eastern flank of the Lochinvar Anticline and dies out down dip. The unconformity records contemporaneous uplift of the anticline. Movement would have taken place along a deep-seated growth fault below the Buchanan Monocline, where seismic work has detected an upthrow to the west of 1440 m, progressively lessening towards the surface (Blayden, 1971). Elsewhere in the Tomago Coal Measures, deposition was uninterrupted.

Only limited information on the depositional environments of the Tomago Coal Measures has been published to date. The bottom half of the unit in the Newcastle–Maitland area (Wallis Creek Formation) has a cyclic series of coal-bearing terrestrial phases and worm-burrowed brackish/marine phases with fossil shell fragments (Brown & Preston, 1985), and therefore represents lower delta plain conditions. Palaeocurrent directions are mostly towards the southwest (Diessel & others, 1985). Within this interval, David (1907) reported

marine fossils at 690 ft (210 m) in the Ironbark Brush DDH1 bore; this level may correspond to the Kulnura Marine Tongue. The top half of the Tomago Coal Measures begins with the Four Mile Creek Formation, a zone of abundant coal seams which may represent the transitional lower delta plain facies of Horne & others (1978). Seam split lines in the Bloomfield area indicate sediment-transport directions to the south and southeast (Britten, 1972b). The unit was followed by the deposition of the bioturbated and burrowed Dempsey Formation, during a reversion to brackish/marine conditions brought about by a eustatic sea level rise (see Chapter 17; Brakel, 1986). This prodelta environment was interrupted briefly by the progradation of a delta lobe, on which the Sandgate seams were deposited, probably as interdistributary peats. An overlying thin, fining-upwards sandstone marks a marine transgression (Warbrooke, 1981), after the lobe was abandoned and compacted.

To obtain more information on the sedimentation in the Tomago Coal Measures, three bores were selected for special study. These were DM Stockton DDH 3, north of Newcastle where the coal measures are completely covered by alluvium; Strevens Terrigal 1, 65 km south of Newcastle; and Shell Dural South 1, near Sydney. The last two bores provide subsurface data on the unit between the outcrop area and the centre of the basin.

DM Stockton DDH 3. This bore penetrated the Tomago Coal Measures sequence overlying the Kulnura Marine Tongue. The latter was recognized by the first appearance of the palynomorph *Dulhuntyspora parvithola* (McMinn, 1982a), and consists of dark, burrowed and bioturbated intervals, comprising 30% of the sequence (Fig. 3–5), which illustrate that the area was close to sea level. The interseam sediments form a lower delta plain assemblage, in which interdistributary bay, distributary mouth bar, distributary channel, crevasse splay, and levee facies can be recognized. Between 335 m and 400 m, there are abundant coal seams and comparatively few burrowed beds, suggesting that it may represent a transitional lower delta setting, aggraded to a somewhat higher level than the underlying beds. This interval may be equivalent to part of the Four Mile Creek Formation. From 216 m to 244 m, a channel belt sandstone is present. The coal seams cannot readily be correlated with those named in outcrop.

Strevens Terrigal 1. In this bore, located in the Lake Macquarie Trough, the total intersected coal measures sequence probably approaches a maximum thickness of the upper coal measures in the basin (Fig. 3–8). The main seams in the Tomago portion of the sequence have been numbered from 11 to 23 (Hunt & others, 1984a).

The base of the coal measures is transitional with highly bioturbated dark siltstone of the marine Maitland Group. The interval beneath the Kulnura Marine Tongue, with seams 23 (bottom) to 16 (top), starts and ends with lower delta plain sediments of burrowed interdistributary bay deposits, overbank silts and clays, and several upward-coarsening splay sands and distributary mouth bar deposits. The portion between seams 16 and 22 shows greater fluvial influence than the rest, with interpreted fine-grained overbank sediments containing plant fragments and minor splay sands. Above seam 16, 140 m of probable upper delta plain sediments, including fluvial sands, are followed by burrowed lower delta plain sediments present directly beneath the Kulnura Marine Tongue. The latter shallow-marine to estuarine unit is intensely bioturbated with many burrows and rare shelly fragments. The overlying seams 15 to 11 are enclosed in lower delta plain deposits, but between seams 12 and 11 there is a 220 m section of sediments with burrowed bay-fill intercalations but no coal. The burrowed and laminated fine-grained interval at the top of the Tomago Coal Measures is equivalent to the marine-influenced Dempsey Formation.

Shell Dural South 1. Dural South 1 is sited in the central Sydney Basin, where the total thickness of the upper coal measures is appreciably above the average for the basin (Fig. 3–8). The sandstones in the coal measures are dominantly pyroclastic and volcanilithic, reflecting contemporaneous volcanism to the east and south, and derivation from pre-Permian volcanics to the north and west of the basin. As this is a rotary drillhole, the lithologies have been interpreted from cuttings, sidewall cores and geophysical logs by Hawkins & Ozimic (1967). The sedimentary sequence is, therefore, known in far less detail than in a fully cored bore, and the interpretations of environments are less definite.

A sequence at the base of the Tomago section displays coarsening-upward cycles on the gamma-ray log, and is transitional with the fine-grained, prodelta sediments of the top of the marine Maitland Group. The interval from 1615 m (5300 ft) to 1535 m (5035 ft) has about 10 coal seams in a lower delta plain sequence consisting predominantly of fine-grained interdistributary bay and overbank deposits. Two major sandstones are underlain by what appear to be thin interdistributary bay sediments, one with rare burrows; these sands probably record distributary mouth bar and succeeding channel environments. No coal has been noted from 1535 m (5035 ft) to 1359 m (4460 ft), namely, the remaining interval below the Kulnura Marine Tongue. Most of this sequence is interpreted as a probable upper delta plain facies, with only a few estuarine beds with rare burrows. A thick dolerite sill is present, and the beds above it probably indicate a reversion to lower delta plain conditions.

The Kulnura Marine Tongue is here a fine-grained unit containing arenaceous foraminifera, rare gastropods, and burrows, deposited on a restricted marine shelf.

The first two coal seams above the Kulnura occur in a sandstone interval which has burrows

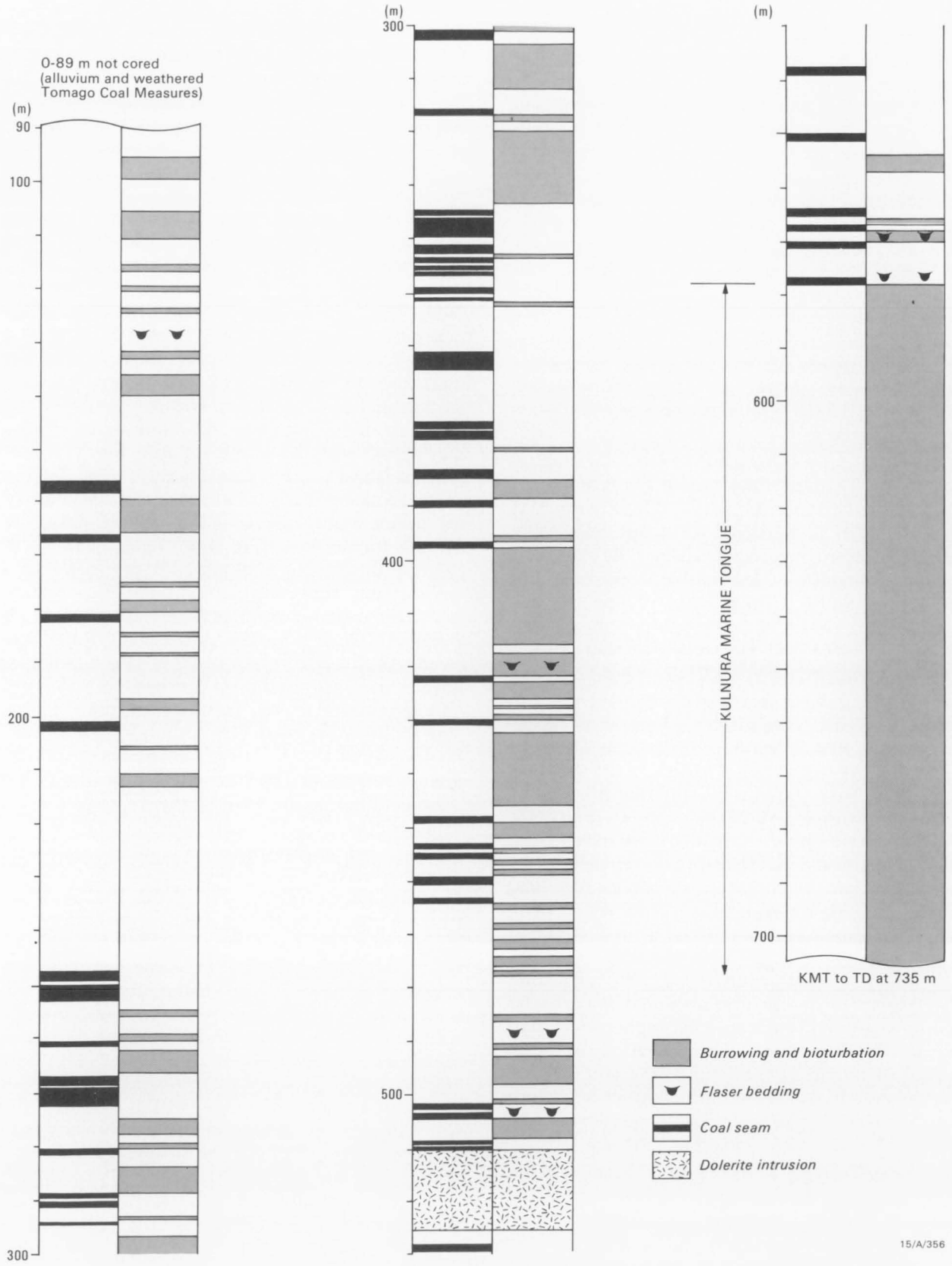

Fig. 3–5. Tomago Coal Measures intersected in DM Stockton DDH3. Coal seams shown on left sides of columns, marine beds on right.

and some pebble horizons. Rare patches of anhydrite may indicate local evaporitic conditions. The origin of this facies is uncertain. It may be the distal part of the Marrangaroo Conglomerate alluvial fan advancing from the west into the sea, because it lies at the same stratigraphic level as the conglomerate unit identified as the Marrangaroo in AOG Kirkham 1 (see Chapter 17; Brakel, 1986). Shallow lagoons and marshes behind fringing bars along the seaward margins of the fan–delta could account, respectively, for local evaporitic conditions and the deposition of coal. Alternatively, the interval may have been formed in a beach zone, so that the coals are back-beach marsh accumulations. The two possibilities are not mutually exclusive, as a fan–delta could develop a substantial littoral zone if sufficiently exposed to wave attack, but if the interpretation of the Kulnura as representing a restricted marine regime is correct, then the beach zone model would appear unlikely. The overlying interval, from 1178 m (3865 ft) to 1058 m (3480 ft), consists of lower delta plain sediments with numerous burrowed estuarine and bay-fill intercalations. Only two coal seams have been identified, and these are found near the top of the interval. Overlying fine-grained sediment, with burrows, is correlated with the marine-influenced Dempsey Formation at the top of the Tomago Coal Measures.

General observations. The Tomago Coal Measures are divided into two depositional sequences by the Kulnura Marine Tongue. The basal sequence grades up from the marine prodelta deposits at the top of the Maitland Group into lower delta plain sediments. In the subsurface intersections, there is a further vertical gradation into upper delta plain facies. In the Newcastle–Maitland region, this facies, if it exists, has not yet been recognized. Immediately below the Kulnura Marine Tongue, a thin interval shows a reversion to lower delta plain conditions, indicating that the tectonic movements, which led to subsidence and the entry of the sea during the Kulnura episode (Chapter 17), were gradual and not sudden. The higher sequence above the Kulnura and below the Dempsey Formation is essentially a lower delta plain facies, which in Dural South 1 starts off as a probable fan–delta subfacies prograding from the west. In the Newcastle region, there appears to be a transitional delta plain facies towards the top, suggesting higher aggradation above sea level in this more proximal region. The Dempsey Formation, at the top of the Tomago Coal Measures, represents a marine incursion and the start of a new cycle that continues into the Newcastle Coal Measures.

The Tomago Coal Measures have a negligible proportion of tuff compared to the succeeding Newcastle Coal Measures (Diessel, 1970), but some tuff is present. For example, the 1 m-thick Thornton Claystone overlying the Big Ben seam is a tuff deposited by a volcanic event which devastated a forest and laid out the tree trunks in a northeast–southwest orientation (Diessel & others, 1985). It is presumed that the trees were felled by a lateral-blast eruption similar to that which occurred in 1980 at Mount St. Helens in the United States.

There are no unequivocal climatic indicators in the Tomago Coal Measures. Some convolute bedding in sandstone between splits of the Rathluba seam may be due to cryoturbation (C.F.K. Diessel, pers. comm.). The DM Stockton DDH 3 bore has several examples of dropped pebbles enclosed in laminated, fine-grained, interdistributary bay sediments, but they are uncommon, and could have been dropped from the roots of floating trees as well as ice.

Wittingham Coal Measures

Like the correlative Tomago Coal Measures across the Lochinvar Anticline, the Wittingham Coal Measures have a basal transition zone (the Saltwater Creek Formation) passing upwards from marine to coal measure deposition (Britten, 1975b). The description of interbedded marine and coal measure sequences (Marchoni, 1976) implies a deltaic setting.

The interseam sediments of the overlying coal measures interval, the Foybrook Formation, are fluvial (Britten, 1972b, 1975b; Gray, 1974). Channel, overbank, and paludal sub-environments can be distinguished. Along the northern side of the Hunter Valley, the streams were meandering, with a moderate to high sinuosity, in a fluvial to upper delta plain setting at the foot of braided piedmont fans encroaching from the orogenic hinterland to the north (Marchoni, 1976). Farther south in the Saxonvale area, coarsening-upward cycles point to lower delta conditions. Characteristic of the interval is an erratic zig-zag style of coal seam splitting (multidirectional splitting); this was caused by the sinking of channel clastics into spongy peat, and when the under-lying peat had compacted, the diversion of the channel belt to adjacent uncompacted areas, where the process was then repeated (Britten & others, 1975). Arenite component and total-sediment isopachs indicate north–south to southeasterly trending troughs between the major anticlines, implying that the latter were high areas (Britten, 1972b; Britten & others, 1975). This is confirmed by coal-rank studies, which indicate contemporaneous movement on the Muswellbrook Anticline (Marchoni, 1976). Clast composition and textural maturity are compatible with sediment transport from the north (Marchoni, 1976).

The Kulnura marine incursion is represented by the Bulga and Archerfield formations (Britten & others, 1975, fig. 18.8). Britten & Smyth (1973) suggested that the Archerfield Sandstone grades upwards from lagoonal to freshwater–lacustrine

facies, and that the succeeding inertinite-rich Bayswater Coal Member formed in similar lacustrine conditions; Smyth (1980) also considered that the coal is of dominantly lacustrine origin. It is more likely that the Archerfield Sandstone sheet was laid down as a littoral sand, which prograded so rapidly that most of the labile component could not be eliminated. Hunt & others (1986) suggest that the Bayswater peat accumulated as a nearly continuous blanket mire on the emergent, subdued-relief surface resulting from the infilling of the preceding marine embayment, and that the high inertinite content of the coal is due to tectonic subsidence, in the eastern half of the basin, lowering water tables in surrounding regions to expose the peat to sub-aerial oxidation.

The coal-bearing sequence of the remainder of the Wittingham Coal Measures (the Jerrys Plains Subgroup) has been described as continental with fluvial components (Britten, 1975b). For the Ravensworth area, a proximal region near the Hunter Thrust, Gray (1974) interpreted a braided fluvial piedmont. In the more distal Saxonvale area to the south, point bar cycles of meandering streams are present, but these could have been part of a general deltaic setting. A study of bore cores from the region between Broke and Aberdeen by Beckett & McDonald (1984) has disclosed that the lower part of the interval represents lower delta plain deposition; the middle section consists of upper delta plain sediments, whereas the upper part displays a reversion to a lower delta environment. The region as a whole was therefore somewhat higher above sea level than the Tomago Coal Measures were at the time, reflecting greater proximity to the tectonically active source area to the north. Arenite component isopachs and a sandstone/shale ratio map for the interval (Britten, 1972b) define a major channel belt along the western side of the Muswellbrook Anticline, which then swings southeasterly across the anticline's southern nose. Total sediment isopachs (Britten & others, 1975) show a trough lying on the same trend, implying that the adjacent anticline was a high area. Other palaeodrainage directions have been reported by Gray (1974) as southwesterly in the Ravensworth area, and by Ingram (1983) as channels 50 m thick and 1.3 km wide, trending 010° between Warkworth and Jerrys Plains. Ingram also noted that there are channels paralleling the Mount Thorley Monocline, suggesting that this north–south structure was already in existence. Coal seams commonly split and deteriorate towards the basin centre to the south, but seams can also split in any other direction, usually because of fluvial clastic wedges. Tuffs are more abundant in the Wittingham Coal Measures than they appear to be in the Tomago Coal Measures to the east.

The Denman Formation at the top of the Wittingham Coal Measures comprises burrowed and bioturbated sediments deposited during the same marine incursion as the Dempsey Formation of the Tomago Coal Measures.

Lower Illawarra Coal Measures

The equivalents of the Tomago Coal Measures in the southern and western parts of the Sydney Basin are the lower portions of the Illawarra Coal Measures below the Darkes Forest and Angus Place Sandstones, respectively. As elsewhere in the basin, the base of the coal measures is transitional from marine to terrestrial (Bunny, 1972; Goldbery, 1969; Bembrick, 1980). In the southern division, latite flows and tuffs record contemporaneous volcanism extending into earliest coal measure time.

The interval between the base and the Kulnura/Marrangaroo level contains the lower delta plain sediments of the Cumberland Subgroup in the Southern division (Bowman, 1980), and ranges from prodelta marine (possibly lagoonal), through beach, to lower delta plain deposits of the Nile Subgroup in the Western Coalfield (Bradley, 1980; Bembrick, 1983). In the south, detritus appears to have been derived from a southern volcanic source (Bowman, 1970, 1980). Overlying the interval, the Kulnura marine incursion is represented in the south by the burrowed sediments of the Erins Vale Formation (Bowman, 1970), but in the west there was no marine episode, its place being taken by the braided fluvial wedge of the Marrangaroo Conglomerate (Bembrick, 1983), which accumulated as an alluvial fan encroaching from the west. The fan eventually spread out to the central Sydney Basin, possibly as far as the Shell Dural South 1 well (see Chapter 17; Brakel, 1986), where it lies on the Kulnura Marine Tongue.

An erosion surface separating the Erins Vale Formation from the overlying Sydney Subgroup (Bowman, 1980), is interpreted by Hutton & Jones (1985) as local scouring by fluvial channels prograding easterly across the underlying beach sand. The Tomago-equivalent portion of the Sydney Subgroup constitutes a lower delta plain facies, dominated by palaeocurrents from the north (Bowman, 1980). The Bargo Claystone, at the top of the interval, is equivalent to the marine Dempsey Formation, and as mentioned previously, shows signs of marine influence near its base, although some authors have regarded it as fluvial.

Sedimentation in the Western Coalfield was somewhat similar for the interval above the Marrangaroo Conglomerate and below the Angus Place Sandstone. Above the Bayswater-equivalent Lithgow Coal, there was a local reversion to braided alluvial fan sedimentation, recorded by the lenticular Blackmans Flat Conglomerate. The succeeding formations are interpreted (Bembrick, 1983) as the deposits of prodelta and lower deltaic facies, in which interdistributary bay, distributary mouth bar, and crevasse splay subfacies can be

recognized. At the top of the interval, the Dempsey-equivalent Baal Bone Formation displays its marine character in its bioturbated and laminated muds, the presence of foraminifera and acritarchs, and its higher than average boron content (Bembrick, 1983).

Tuffs are not prominent in the Tomago-equivalent portion of the Illawarra Coal Measures, except in the south towards the base, and as bands within the Woonona and Tongara seams. Some thin possible tuff layers are present in the Western Coalfield.

The climate appears to have been cold. Bembrick (1983) envisaged for the western region "a climate cold enough to allow river ice to form and be flushed through the deltas to melt in the adjacent bays". The evidence for this comprises arenaceous foraminifera known to have favoured cold water, and the relative abundance of dropstones and clast clusters.

Newcastle, Wollombi and Upper Illawarra Coal Measures

The time interval represented by the Newcastle Coal Measures saw a continuation of the long-term progradational trend that was interrupted by the marine incursion at the end of Tomago time. The new cycle of progradation started with the littoral and coastal dune sands of the Waratah Sandstone and equivalents, passed through a progression from lower delta to upper delta plain facies, and gave way in turn to fluvial sedimentation, which in the north culminated in proximal alluvial fan wedges derived from highlands to the north and east. Volcanism was important especially in the north, and some volcanic ash falls may have been responsible for raising the depositional surface sufficiently to affect sedimentation patterns in subsequent beds.

Newcastle Coal Measures

The Waratah Sandstone at the base of the Newcastle Coal Measures marks the end of the Dempsey marine incursion and the transition to renewed coal measure sedimentation. The unit originated as a coastal sand complex (including beach, offshore bar, and subaerial dune environments), which migrated rapidly south as the sea regressed, leaving behind it a sand sheet with bimodal cross-stratification (Warbrooke, 1981). The compositional immaturity of the sand reflects the large influx of detritus from the adjacent tectonically mobile hinterland being supplied to a rapidly receding coastal zone.

The precursor peat of the Borehole seam accumulated in a fluvial–swamp system behind the beach zone (Warbrooke, 1981). In the lower half of the Newcastle Coal Measures, swamps remained the dominant feature, but short-lived fluvial episodes interrupted the swamp development from time to time in any one place. Channel, levee, crevasse splay, floodplain, lacustrine and backswamp environments have been recognized (Williams, 1978; Diessel, 1980; Warbrooke, 1981). Pulsatory uplifts in the source areas interrupted the normal patterns of sedimentation with rapid influxes of fluvial gravels which cut deeply into previously deposited sediments (Branagan & Johnson, 1970). The increase in tectonic and volcanic activity in the source areas, and the advance of more proximal facies, led to a change in fluvial style from meandering rivers to braided channels, and to an increase in the frequency of alluvial fan intercalations (Davis, 1973; Warbrooke, 1981). Connolly & Ferm (1971) interpreted most of this interval as lower delta plain facies, grading to upper delta and alluvial plain facies above the Montrose seam. Cross-stratification, seam split lines, channel zones defined by sandstone/shale ratios, pebble imbrication, and the elongate fan shapes of the conglomerates show that the palaeocurrent directions were chiefly from the north and northeast (Warbrooke, 1981; Branagan & Johnson, 1970; Diessel, 1980; Williams, 1978).

The upper half of the Newcastle Coal Measures is dominated by alluvial plain to braided piedmont deposition, becoming increasingly proximal upwards, until at the top of the sequence an association of coal seams sandwiched between the thick conglomerates of alluvial fans was formed. The bulk of the fluvial sediments consists of coarse and very coarse clastics, in which Ziolkowski (1978) has recognized the deposits of deep-braided, shallow-braided, low-sinuosity and high-sinuosity streams. Overbank development was very restricted, except in association with high-sinuosity channels. Palaeocurrents at first came from a northerly direction, but displayed a swing in successive units to come from the northeast and east (Ziolkowsky, 1978).

Away from the outcrop areas, downdip towards the basin centre, the conglomerates grade into thinner sequences of finer-grained clastics. In the Terrigal 1 bore, the Newcastle Coal Measures are characterized mainly by fluvial sandstones and overbank sediments. The thickest conglomerate is a 25 m-thick unit between the Montrose and Australasian seams (Hunt & others, 1984a). At the base of the sequence, the Waratah Sandstone equivalent is a thick sand with some evidence of reworking in its upper part. This is followed by lower delta plain sediments with burrowed intervals, above which the succession becomes increasingly fluvial.

The Dural South 1 bore in the central Sydney Basin records a more distal sequence than those to

the north (Hunt & others, 1984b). The Waratah Sandstone equivalent at the base has a coal lens towards the middle, in a shaley (?)burrowed interval possibly representing back-barrier deposition. The coals in the basal portion of the Newcastle Coal Measures are enclosed in lower delta plain sediments, in which floodplain deposits and the fining-upward cycles of laterally migrating meandering stream are evident. The upper portion of the coal measures section, with sandstone as the dominant lithology and fining-upward point bar cycles constituting most of the sequence, accumulated in an upper delta plain to alluvial plain setting. Unlike the equivalent sequence in the Newcastle region, there are no braided stream or alluvial fan deposits.

Drilling in the adjoining Dural–Macdonald River region to the north similarly intersected a lower interval which is essentially a lower delta facies, and an upper interval of upper delta to alluvial plain facies (Packham & Emerson, 1975). In the more northerly bores, braided stream activity overwhelmingly dominated in the alluvial plain facies, and the sediments are interpreted as braided sheet outwash, located downstream from the alluvial cones of the Newcastle area.

In the sediments immediately overlying the Newcastle Coal Measures, a return to marine influence is suggested by glauconite in the Dural South bore (Hawkins & Ozimic, 1967), and by foraminifera elsewhere at this level (Scheibnerova, 1980).

The proportion of pyroclastic detritus contributed to the Newcastle Coal Measures by contemporaneous volcanism, as air-fall and reworked tuff, is much greater than the 19% previously believed (C.F.K. Diessel, pers. comm.), and must have had significant effects on patterns of sedimentation and coal deposition. The "Seahampton Sandstone", at Reid's Mistake (Swansea Heads) in the upper portion of the coal measures, has now been recognized as an ignimbrite, while fossil tree stumps and logs below it have been identified as the remains of a forest hit by a directed volcanic blast coming from the northeast (Diessel, 1984). This would place the eruptive centre on the Northumberland Ridge to the east of the present coast. It is likely that at least the northern end of the ridge was volcanically active, and that most, if not all, of the pyroclastic debris in the Newcastle Coal Measures emanated from there, instead of from the much more distant eruptive centres in New England, as postulated by Brownlow (1979). (The latter centres, however, are the most likely source of tuffs of the same age in the Gunnedah Basin.) The Northumberland Ridge is also the obvious source of supply to the alluvial fan wedges preserved in the Newcastle Coal Measures, as it lies close by and in the right direction. Uplift of the ridge would, therefore, have been contemporaneous with volcanicity.

Tectonism throughout Newcastle Coal Measures time, along the northeastern edge of the basin, is confirmed by the increase in proportion of grains of metamorphic and sedimentary provenance in the sandstones, relative to the Tomago Coal Measures, as shown in the Dural South bore. This implies that the source areas were being uplifted. But while the sedimentary response to uplift and volcanism in the hinterland profoundly affected the character of the Newcastle Coal Measures sediments, synsedimentary subsidence in the depositional area also left a marked imprint, particularly on the thickness and distribution of rock bodies and coal accumulations. The Borehole seam, for example, is poorly developed in the axial region of the present Macquarie Syncline, but has thick coal around the syncline margins; this is because the structure was subsiding at the time of deposition and the deeper axial region held water that was too deep for optimal plant growth (Branagan & Johnson, 1970). The trend-surface maps produced by Johnson (1974) also clearly display the close relationship between sedimentation and structure, and indicate that although the greatest subsidence was in the north next to the tectonically active margin, the volume of sediment influx was so high that deposition outpaced subsidence and a southerly dipping palaeoslope was maintained.

Independent evidence for differential subsidence in the Newcastle Coalfield was provided by Diessel (1975), who showed that a greater proportion of the coalification on the flanks of the Lochinvar Anticline was post-folding relative to that in the Macquarie Syncline, implying that coals in the syncline were already deeply buried before the start of the post-Permian orogenic folding. Palaeocurrent trends are also consistent with syndepositional differential subsidence along the Macquarie Syncline axis (Branagan & Johnson, 1970; Johnson, 1974). The syncline is on trend with a major meridional fault in the Carboniferous terrane to the north, leading Branagan & Johnson to put forward the interesting postulate that the fault extends south in the basement below the Sydney Basin and has controlled the development of the Macquarie Syncline.

The Lochinvar Anticline appears to have been a relatively high, stable ridge, against which the coal measures thin. As there is no evidence of substantial amounts of detritus eroding off it (Branagan & Johnson, 1970), it was probably covered by a veneer of coal measures, which was stripped off the crest when the ridge rose before being covered by Triassic sediments.

The climate at the time was warmer than previously, but still very cool, judging by the few specimens and small size of vertebrate fossils found (Retallack, 1980). The impoverished fossil insect assemblage similarly indicates cold temperate conditions, likened by Riek (1972) to the present climate of the Great Lake area of Tasmania, although at an elevation closer to sea level.

Wollombi Coal Measures

At the base of the Wollombi Coal Measures is the Watts Sandstone, a sheet sand like its correlate, the Waratah Sandstone in the Newcastle Coal Measures, and of similar littoral origin. Although no detailed sedimentological analysis has been done on the overlying coal-bearing succession, it has been described as a sequence dominated by fluvial channel and overbank facies (Britten, 1975b; Britten & others, 1975). The increasing prominence of conglomerate towards the top suggests that, like the Newcastle Coal Measures, the region came under the influence of an encroaching braided fluvial piedmont late in the interval. Tuffs are common, and Britten (1975b) suggested that the widespread tuffaceous material filled and levelled any differential subsidence to give a greater depositional stability than in the underlying Wittingham Coal Measures, which are characterized by zig-zag seam splitting.

Upper Illawarra Coal Measures

The portion of the Illawarra Coal Measures above the Bargo Claystone in the Southern division, like its equivalents elsewhere in the Sydney Basin, displays a prograding transition of environmental facies. However, the sequence has a more distal aspect, because, as is indicated by the convergence of palaeocurrents in the region (Diessel & Moelle, 1970), the outlet of the basin drainage to the sea was close by. Conolly & Ferm (1971) compare the distribution of lithologic units in the section above the Wongawilli seam to that in the lower delta plain facies of the Newcastle Coal Measures below the Montrose seam, recognizing a similar environment, and regard the section below the Wongawilli seam as a transition of lower delta facies with marsh peats into more seaward deposits which were never aggraded to the level at which plants could take root. Isopachs of the Darkes Forest Sandstone and the younger Kembla Sandstone exhibit bifurcating downslope distributive channel patterns, as would be expected on the lower delta plain (Bowman, 1980). Unique to the Southern Coalfield is the widespread occurrence of stone rolls in the Bulli and Wongawilli seams. These hummock-shaped bodies of shale and mudstone rising from the seam floor, with a linear trend in plan, pose serious problems in mining the coal. They originated as muddy channel deposits, which were subsequently compacted (Diessel & Moelle, 1970). A sandy river system in the roof strata of the Bulli seam has been described by Diessel & others (1967).

The upper Illawarra Coal Measures decrease in thickness towards the south, accompanied by a thinning in the two upper coals, the Balgownie and Bullie seams, as well as in the intervening strata. The Narrabeen Group sandstones have prograded over the coal measures, eroding them in part (Bowman, 1970). Rock units thicken in synclines and thin over anticlines on both regional and local scales, indicating that the structures were active during deposition and influenced the thickness of accumulating sediments (Jakeman, 1980; Bowman, 1980).

In the Western Coalfield, the Newcastle-equivalent interval begins with the Angus Place Sandstone, which has low-angle cross-bedding and sporadic burrows (Bembrick, 1983), and probably records a littoral environment similar to that of the Waratah Sandstone. The overlying lower delta sediments pass upwards into an upper delta to fluvial facies, characterized by many thin coals which split and merge, locally forming thick banded coal units. The sandstones indicate a relatively high-energy fluvial regime with point bar development, but near the top of the sequence a brief return to bay-fill sedimentation is indicated by an acritarch-bearing siltstone (Bembrick, 1983). The overall trend reflects that in the interval elsewhere in the basin. As is the case in the Southern division, the overlying Narrabeen Group sediments are erosive into the coal measures, in places truncating coal seams. Also similar is the activity of contemporaneous structures which affected sedimentation (Bembrick, 1983).

Structure Contour and Isopach Maps

Structure contours were compiled for five lithostratigraphic horizons in the Sydney Basin, and are shown on the relevant 1:2 500 000 maps for eastern Australia (Plates 6–7, 9–11). These horizons are the base and top of the Greta Coal Measures, the base of the Tomago Coal Measures and equivalents, and the base and top of the Newcastle Coal Measures and equivalents. In order to show greater detail than is possible at this scale, the structure contours for the Greta Coal Measures have also been reproduced as Figs 3–6 and 3–7, at 1:1 000 000 scale. All elevations on the maps are given in metres relative to mean sea level. The horizons used were selected for contouring because they are the bases or tops of the main coal-bearing sequences in the basin, or in the case of the Newcastle Coal Measures base, represents an important mappable horizon within the upper coal measures. There are no Sydney Basin contours on the maps for the basal coal measures (Plates 4 and 5), because the spot occurrence of the Garretts seam cannot be contoured, while the Clyde and Yarrunga Coal Measures have been included with the middle coal measures, as discussed in Chapter 17.

Three isopach maps have also been constructed: for the Greta Coal Measures (Plate 8), the Newcastle Coal Measures (Plate 12), and the total upper coal measures (Fig. 3–8).

A total of 138 primary control points in the Sydney Basin, and the adjacent part of the Gunnedah Basin south of 32° latitude, were used to draw the contours. The points are from petroleum exploration wells and coal bores, but also include data from excavations and outcrop sections where appropriate. Locations of these control points are shown on the Sydney–Gunnedah Basins Control Point Distribution chart (Plate 39), while the relevant information for each point is given in the data-base microfiche. At the onset of the project, it was decided to adopt an average control point-spacing of 25 km for all basins. The spacing is greater than this where information is sparse, and conversely, points are closer together where geological conditions show rapid lateral change, or where one drill intersection or outcrop does not display the full lithological sequence and needs to be complemented by a nearby point. Coverage is therefore good in the main areas of active mining and exploration, but relatively poor in parts of the southern basin, the north-central basin, and the area overlain by the Tertiary Liverpool Range basalts. Some secondary control points were obtained from the literature where required for particular maps, but these are not indicated on the maps or listed in the data base. Along the western basin margin, some gaps were filled by approximate elevations from geological maps which also portrayed topographic contours. In addition, supplementary seismic information and published contour maps were used, particularly unpublished working compilations of seismic data as interpreted by the authors of BMR Bulletin 149 on the Sydney Basin (Mayne & others, 1974), as well as the contour maps of the Goulburn Valley region given by Holmes (1974, 1976), and the top-of-Permian structure contours on the 1:1 000 000 Tectonic Map of New South Wales by Scheibner (1974). Some faults, and some extensions of known faults, have been inferred.

Consecutive structure contour maps for the base and top of coal measure intervals were compared and reconciled to ensure that there are no plotting discrepancies which result in contours on the base indicating a higher topographic elevation than

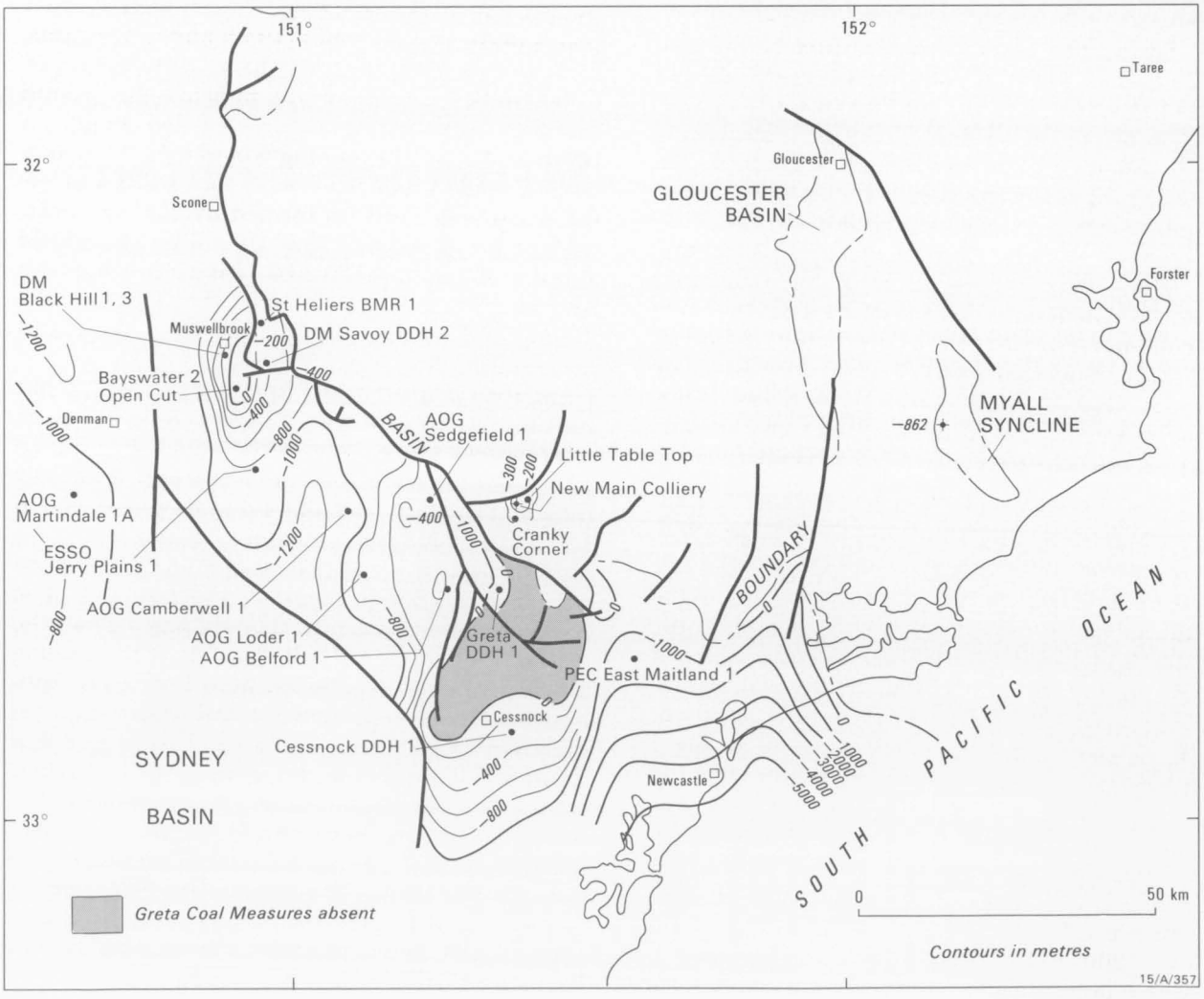

Fig. 3–6. Structure contours: base of Greta Coal Measures.

contours on the top of a unit. Isopach maps were cross-checked with structure contours on the upper and lower bounding horizons to be certain that they are mutually consistent.

Structure Contours

Base of Greta Coal Measures (Plate 6 and Fig. 3–6)

Control on the structure contours is good where the Greta Coal Measures are mined at shallow depths around the Lochinvar Anticline, Muswellbrook Anticline, and the Cranky Corner Basin. Between these structures, petroleum exploration wells provide the data points. For the Newcastle district, however, the only information comes from seismic work which suggests that the coal measures lie at a depth below Newcastle of about -4000 m (J. Stuntz, pers. comm.); the nearest precise data are from the PEC East Maitland 1 well, and outcrops. The northeastern Muswellbrook Anticline area has been extensively faulted into small blocks, and is therefore more complex than the simplified picture shown. The Greta Coal Measures have been intersected in the AOG Martindale 1 well southwest of Denman, but are not known southwest of the Hunter Valley or south of Lake Macquarie. The petroleum drilling in this region, the AOG Mt Murwin 1, Mellong 1, Kulnura 1, and Esso Howes Swamp 1 wells, did not reach this horizon. There is evidence of a fault or monoclinal fold in the subsurface between Broke and Jerrys Plains, paralleling the Hunter Thrust (Stuntz, 1972b), and the contours have not been extrapolated beyond it. Stuntz also described a submeridional fault system (the Mt Ogilvie Fault) east of Martindale; the contours west of this fault have poor control, but are presumed to have the same general form as those of the higher Wittingham Coal Measures.

The contoured horizon is at shallowest depths around the prominent Lochinvar and Muswellbrook Anticlines, as expected, and in both cases the gentlest gradients on the fold flanks are on their southerly plunging noses. The horizon is also at or close to the surface along the basin margin north of Newcastle, but the unit is absent in places here, and even where present it is no more than a few metres thick. As well as the major anticlines, the smaller Belford, Loder, and Sedgefield Domes are apparent on the map, the coal measures base lying at elevations of –400 m or more relative to mean sea level. The dominant structure between the major anticlines is a deep trough, the Bayswater Syncline, in which the base of the coal measures plunges to below –1200 m. The deepest known coal measures, however, occur in the Lake Macquarie Trough on the coast, where they are known to go down to about –4000 m and are probably deeper farther south. Structures which affect this area are the Macquarie Syncline, and to its northeast, the Medowie Syncline which turns seaward off Newcastle.

Only spot elevations can be plotted for the lenticular Clyde and Yarrunga Coal Measures in the southern Sydney Basin. The base of the measures lies variously between –251 and –558 m (MSL) in three drill holes southwest and southeast of Nowra. The other localities are surface outcrops.

Top of Greta Coal Measures (Plate 7 and Fig. 3–7)

The structure contours for the top of the Greta Coal Measures are broadly similar to those for the base, illustrating that the effect of post-depositional folding on the contours is much greater than thickness variations in the unit.

As the main seam mined around the Lochinvar Anticline (the Greta seam) lies near the top of the coal measures, this map is a guide to the depth of economic coal in that area. It can be seen that the largest area of mineable coal is on the broad, gently dipping southern flank of the structure. The contours here are controlled by 20 second-order points derived from Jones (1939) and topographic contours. At 33° latitude, the horizon has plunged to 600 m below MSL, or 750 m below the ground surface. The practicable overburden limit, on present Australian mining standards, is 600 m (Wilson, 1975). Farther south, the coal lies below the scarp and tableland formed by Triassic rocks, the topographic elevation of which would add another 300 m to the overburden. Combined with the gassy nature of the coal, this would make mining unfeasible with present technology and economics.

On the Muswellbrook Anticline, a similar but smaller, gently dipping shelf is indicated on its southeastern flank. Coal in the anticline is mined from throughout the Rowan Formation, especially from the thick basal Balmoral seam about 100 m below the contoured horizon.

A third area with accessible coal is located around the Sedgefield and Belford Domes. The coal-bearing interval is 427–466 m below the ground surface in AOG Belford 1, at the mining depths projected for the southern Lochinvar Anticline. In AOG Sedgefield 1, coal seams occur at shallower depths, in the interval 77–474 m below ground. This well was not drilled on the highest culminations of the Sedgefield Dome, and the top seam may lie at open-cuttable depths. The area does not seem to have been considered before as a coal prospect, and there are no drill-hole cores or coal quality data available. To the west, the Camberwell Anticline and Loder Dome, respectively, have their uppermost coal at 690 m and 705 m below ground level, too deep for present mining techniques.

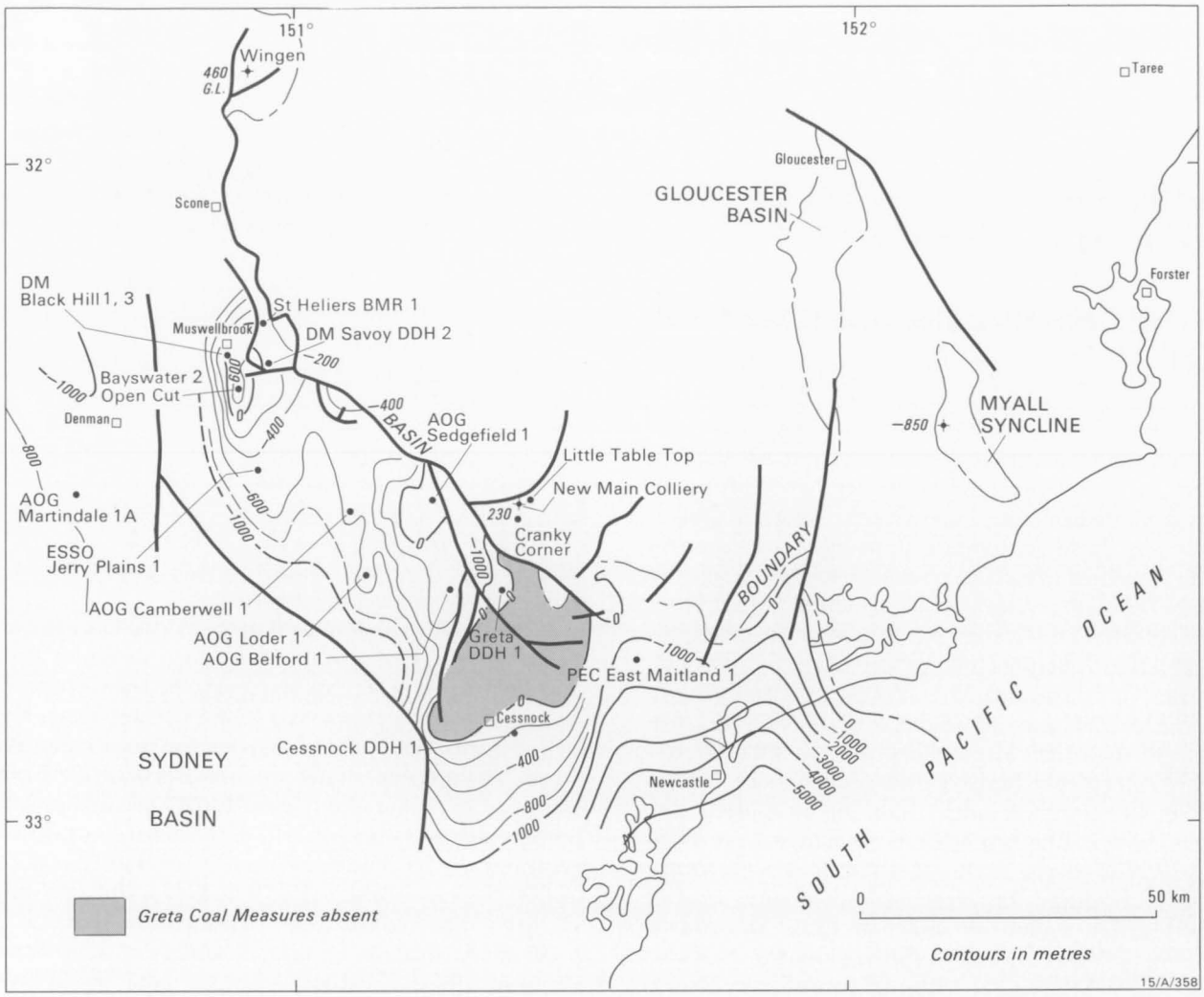

Fig. 3–7. Structure contours: top of Greta Coal Measures.

In the basin edge area north of Newcastle, the Greta Coal Measures crop out at the surface or lie under alluvium, but as the unit is very thin or absent, economic coal deposits are unlikely.

Again, only spot elevations can be given for the lenses of Clyde and Yarrunga Coal Measures in the southern Sydney Basin, and for the coal measures at Wingen. In the drill holes near Nowra, the tops of the measures lie between –226 m and –493 m (MSL). Elevations of the surface occurrences were determined by reference to topographic contour maps, and show ground-level (GL) elevation relative to sea level.

Base of Tomago Coal Measures and equivalents (Plate 9)

The structure contour map for the base of the upper coal measures relies on 70 primary control points, and supplementary data where appropriate. In the coastal region, the Hunter and Goulburn Valleys, and the Western Coalfield, most points represent fully cored coal exploration bores, while in the more central regions of the basin petroleum exploration wells provide the information. Some bore holes do not reach the horizon, but are still useful because they give a minimum depth below which it must lie. Coverage is poor north of Newcastle, north of the Goulburn Valley, and in parts of the Macdonald Trough. Along the western margin, outcrop elevations were used to fill-in data gaps.

In general, the contours show the low-gradient Blue Mountains–Illawarra Shelf, to the east of which is the Lapstone Monocline zone dipping steeply towards the deeper eastern half of the basin. The Nepean–Kurrajong fault system is shown, with a splay towards Wollongong, and it is likely that the system extends northwards under the monocline to link up with the Mt Ogilvie Fault near Denman. The horizon reaches its greatest depth, below the –2000 m contour, in the depocentre around Broken Bay near Gosford. There also appears to be a deep area (below –1000 m) along the northeastern side of the presumed "Broke fault". The most pronounced local structures are the Lochinvar and Muswellbrook Anticlines, and lesser domes, in the Hunter Valley

Dome Belt. The Lochinvar Anticline continues southwards to the depocentre as the more subdued Kulnura Anticline. South of Sydney, the Woronora Ridge shows as a gentle faulted spur, the expression of which is due more to faulted downthrow to the southwest than to the shape of the pre-faulted surface. The faulting in this area may be more complex than shown.

Base of Newcastle Coal Measures and equivalents (Plate 10)

The shapes of the contours of this level generally resemble those of the previous chart, but the region of greatest depth has moved southwards, and consist of three areas where depths exceed –1200 m: one under Sydney and two to the northwest, all in the Cumberland Sub-basin. The Lochinvar–Kulnura Ridge now extends almost as far south as Parramatta, and clearly separates the Macdonald and Lake Macquarie Troughs. The Woronora Ridge south of Sydney has also become somewhat more pronounced, and although not shown on the map, faulting is probably still present, but with smaller displacements. The Nepean–Kurrajong–Lapstone fault system can be shown with greater, but not complete, confidence to connect northwards with the Mt Ogilvie Fault. The Mt Coricudgy Anticline is prominent in the northwest, and has a saddle near Denman. The Dome Belt in the upper Hunter Valley cannot be shown, because the Wollombi Coal Measures are absent around the major structures.

Top of Newcastle Coal Measures and equivalents (Plate 11)

The structure contours on top of the upper coal measures are based on those given on the 1:1 000 000 Tectonic Map of New South Wales by Scheibner (1974), with some amendments where additional data have become available. The regional control is provided by drill hole, excavation, outcrop, and seismic information, as with the previous maps of the upper coal measures, but coverage is improved because of the greater number of bores that intersect the horizon. However, there has been some contraction of the area that can be contoured, because the top of the coal measures has been eroded in most of the Hunter River region. Again, no data coverage exists in the northwestern region overlain by the Tertiary Liverpool Range basalts, but contour trends in adjacent areas tentatively suggest a basinal structure underlying the region, with an axis on line with the saddle in the Mt Coricudgy Anticline near Denman.

The overall morphology of the Sydney Basin is retained on this map, and the structural elements present at lower levels persist. The Lapstone Monocline is faulted at the –400 m to –600 m contour interval west of Sydney (not shown), as a result of Tertiary movements which uplifted the Blue Mountains–Illawarra Shelf. The Lochinvar–Kulnura and Woronora Ridges appear as gentle spurs and swells, cut across by the east–west trend of the Cumberland Sub-basin. The latter still forms the deepest region of the basin, and plunges to below –1000 m northwest of Sydney, along the trend of the Macdonald Trough. The Lake Macquarie Trough is less conspicuous than on the previous chart, suggesting that subsidence here slowed down in post-coal measures time. From this map it is apparent that the coal measures are shallowest along the northern, western, and southern basin margins, which is why mining is at present confined to those areas.

Isopachs

Greta Coal Measures (Plate 8)

The isopachs for the Greta Coal Measures have been constructed using 17 primary control points in the Hunter Valley region. The map is a modification of the corresponding part of fig. 17 of Mayne & others (1974), the changes stemming from the incorporation of additional data.

The most striking feature is a depocentre located north of Singleton, where the unit exceeds 480 m in thickness, and from which the thickness appears to decline radially to the west, south and east. Superimposed on this pattern is a westerly elongation, as well as overthrusting from the northeast by the Hunter Thrust. On the chart, the influence of the Muswellbrook and Lochinvar Anticlines on deposition is ambiguous. On one hand, as discussed previously, coalification studies (Diessel, 1975) and the splitting of coal seams away from the crestal zones of anticlines (Britten & others, 1975) imply that there was more rapid subsidence in synclinal zones and that the structures were active in Greta time. On the other hand, the isopach contours display no clear reflection of this, although they are not necessarily inconsistent with the other evidence. The thickness maximum lies between the two major anticlines, probably because this was the site of greatest subsidence, rather than because it was coincidentally the location of the apex of a single large alluvial fan. The westerly elongation of the pattern suggest an apron of coalescing fans, whose ultimate thickness varied locally according to the degree of subsidence. The clastics in the fans were derived from a source to the north or northeast which would have been uplifted in response to the same tectonism (probably the Early Permian E–W compression of Gale, 1980) that activated the structures in the depositional region. This will no doubt be clarified

when more drilling gives further information on thickness variations, sandstone/shale ratios, and palaeocurrents.

The Cranky Corner Basin, which sits on the thrust sheet and was carried an unknown distance southwest with it, exhibits a southerly thickening trend from 139 m to 334 m in its Greta Coal Measures. The very presence of the coal measures here, taken together with the fact that the Hunter Thrust dies out 20 km to the southeast, north of Maitland, suggests that forward movement on the thrust was of the order of kilometres, or at the most tens of kilometres, rather than hundreds.

If the Macquarie Syncline south of Newcastle was active at the time, as the major structures to the west were, then the thickness of the coal measures in its centre would be greater than the 66 m in the PEC East Maitland 1 well on its periphery. North of Newcastle, the unit is absent in places.

In the south of the Sydney Basin, isopachs cannot be shown for the Clyde and Yarrunga Coal Measures because each occurrence is a lens that was never physically continuous with others. Spot thicknesses for outcrops and drill holes range from 4 m to 65 m, and except for a 41 m value on the western basin margin, indicate a thickening trend distally, towards the east.

Newcastle Coal Measures and equivalents (Plate 12)

To construct the isopach map for the Newcastle Coal Measures and equivalents, 69 primary control points were used, some secondary points where required, and thickness differences where structure contours for the base of the Newcastle Coal Measures cross those for the top of the unit.

The greatest thickness occurs in the Lake Macquarie Trough, exceeding 420 m. Rapid thinning is seen immediately to the west, on the Lochinvar–Kulnura Ridge, indicting that the ridge was a relative high at the time of sedimentation, while the trough underwent very pronounced subsidence. This confirms the results of lithofacies and coalification studies. On the crest of the Lochinvar Anticline, the absence of the coal measures is not due solely to reduced deposition, for the unit was locally eroded away completely as the anticline rose, before the overlying Triassic rocks were laid down.

Other notable areas of thicknesses greater than 300 m are present in the Cumberland Sub-basin below Sydney and in the Macdonald Trough. One of these lies along the northern side of the "Broke fault", implying that this structure was active during sedimentation with subsidence on the northern side. On its southern side, relative uplift is indicated by an easterly trending "valley" of reduced thickness of the unit, on a line between Kandos and Cessnock.

Also of interest is the meridional trend of the isopachs near Denman, parallel to the Mt Ogilvie Fault, suggesting that this fault too was active and formed a depositional hinge line. It is on trend with the Lapstone structure to the south, another depositional hinge line. West of this trend, on the Blue Mountains–Illawarra Shelf, the Newcastle Coal Measures equivalent is thin, usually less than 120 m thick. This is attributable to the stability of the shelf, on which subsidence was slow compared to that in the eastern basin.

Near Mittagong, and locally in the Western Coalfield, the preserved thickness of the unit is less than the original depositional thickness, because the top of the coal measures has been removed to varying extents by Triassic fluvial erosion.

The local thickening of the unit in synclines of supratenuous folds in the Southern Coalfield (Jakeman, 1980; Bowman, 1980) is evidence for contemporaneous movement on these folds, but is not large enough to be resolvable with the 60 m contour interval.

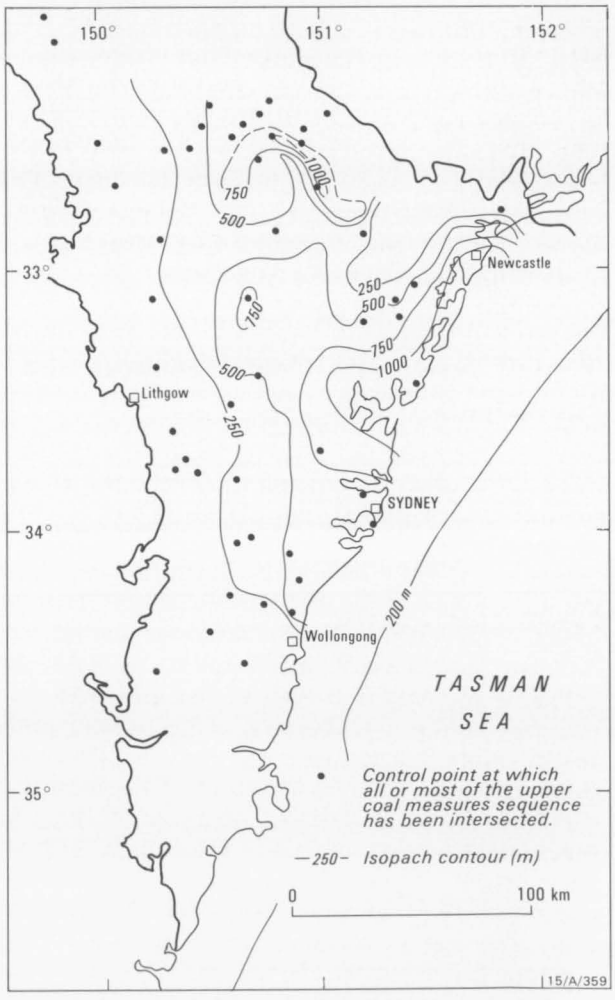

Fig. 3–8. Isopachs of the upper coal measures, Sydney Basin (Newcastle and Tomago Coal Measures, Singleton Supergroup, and Illawarra Coal Measures).

Total Upper Coal Measures (Fig. 3–8)

This map shows the combined thickness of the Tomago and Newcastle Coal Measures and equivalents, and therefore includes the interval of Plate 12. It is based on 57 primary control points, some of which were not available to Stuntz (1972a), and the map therefore is more accurate than the isopachs given by him.

The main depocentre is located along the Lake Macquarie Trough and around Broken Bay, the greatest recorded thickness being 1216 m in the Terrigal 1–1A bore. It is apparent from the Newcastle isopachs (Plate 12) that the Newcastle Coal Measures make a substantial contribution (about 40%) to the thickness in the trough. The remainder is due to the Tomago Coal Measures, indicating that the trough was subsiding throughout upper coal measures time. In addition, a wider area of deep subsidence around Broken Bay, also indicated by the structure contours of Plate 9, was present in Tomago time, but had been displaced towards Sydney by Newcastle time. To the west of the trough, the Lochinvar–Kulnura Ridge was a relative high throughout upper coal measures time. Likewise, the deep depocentre along the northern side of the "Broke fault", with more than 1000 m of sediments, was a persistent feature.

The gross aspects of the Macdonald Trough, Lapstone hinge line, and Blue Mountains–Illawarra Shelf are apparent, and subtraction of the Newcastle thicknesses from the total again shows that these structural elements were already present in Tomago time. There is no indication of the Woronora Ridge on either of the Late Permian isopach maps, hence it is a post-Permian structure. The presence of an east–west "valley" between Kandos and Cessnock, as on the Newcastle isopach map, is uncertain, because the 500 m isopach can be interpreted equally well as a thinning across the trend of the trough as shown, or as outlining a continuous Macdonald Trough.

Conclusions

The contour maps provide a great deal of insight into the evolution of the Sydney Basin, including the depositional history of the coal measure sequences.

The main structural elements of the basin appear to have been present from its inception, when at the start of the Permian a north–south volcanic rift formed along a pre-existing basement fault. The western side of the rift became the Lapstone hinge line, which has been intermittently active during the Permian, and thereafter. It separates the Blue Mountains–Illawarra Shelf from the Macdonald Trough, the latter occupying the site of the underlying rift. The eastern side of the rift came to define the western margin of the Lochinvar–Kulnura Ridge (see Chapter 28). Thus, from the beginning, a meridional structural anisotropy was established in the basin and it may well have been present also east of the Lochinvar–Kulnura Ridge, where structures known to have been active in the Late Permian follow similar trends.

In the Greta Coal Measures, coalification studies and the direction of splitting of coal seams show that there was relative movement between the Bayswater Syncline and the adjacent Muswellbrook and Lochinvar anticlines. This is indicated by the Greta isopachs in only a general way, because of lack of detailed data, as a depocentre in the sinking synclinal area. The isopachs do, however, imply an apron of coalescing alluvial fans, advancing from an uplifted source to the north. The Cranky Corner Basin at the time probably lay some kilometres or tens of kilometres northeast of its present location.

The structure contours for the Greta Coal Measures display areas of gentle dips at minable depths on the southern and southeastern flanks of the two major anticlines. Additional coal measures at shallow depths are in the Belford and Sedgefield Domes.

During Tomago Coal Measures time, the depocentre was positioned in the Broken Bay area near Gosford. The north–south cross-section (A–A' in Plate 13) suggests that initial accumulation was thickest in both the centre and south of the basin, but that the depocentre moved northwards after the marine incursion of the Kulnura Marine Tongue. Both the Lake Macquarie and Macdonald Troughs were actively subsiding, while the adjacent Lochinvar–Kulnura Ridge and Blue Mountain–Illawarra Shelf formed relative highs on which thinner sequences were deposited. Uplift on the Lochinvar Anticline early in the interval resulted in local erosion and an unconformity. Pronounced subsidence also took place on the northern side of a probable fault between Broke and Jerrys Plains, which Stuntz (1972b) considered was active just before the Kulnura marine episode (Bulga Formation). It is conceivable that the upper Hunter region formed a block bounded by the Broke and Mt Ogilvie faults, which tilted to the south, so that the thickest coal measure sequence was laid down along its southern side. Subsidence of the block would also explain the observed rank differences in coal across the Mt Ogilvie Fault. The Muswellbrook Anticline seems not to have resumed activity until after the marine event. The Kulnura Marine Tongue itself resulted from the eastern half of the basin subsiding along the reactivated Lapstone line, probably as an expression of the same tectonic movement which initiated the "Broke fault".

Newcastle Coal Measures time saw the main depocentre shift northwards to the Lake Macquarie area, while subsidiary depocentres existed in the Cumberland Sub-basin, the Macdonald

Trough, and the northern side of the "Broke fault". The basic tectonic and depositional framework, however, remained the same as for the Tomago Coal Measures, with active structures in the Hunter Valley, Western Coalfield, and Southern Coalfield influencing sedimentation. Most clastics were derived from the rising New England orogen to the north, or from the northern end of the Northumberland Ridge, which was the site of much volcanic activity. There is some evidence of renewed estuarine influence at the close of coal measure deposition, followed by fluvial erosion of the coal measures in the north, west, and south. On the southern Lochinvar Anticline, uplift tilted the coal measures so that they came to lie unconformably below the Triassic, and locally the entire upper coal measures succession was removed. During the Triassic, the rate of subsidence appears to have slowed, at least in the Macquarie Syncline.

The final form of the basin architecture, as it exists at the present day, was determined to a large extent by the Triassic "Hunter–Bowen Orogeny" and Tertiary uplifts, which had the effects of causing further folding in the Hunter Valley Dome Belt, the overriding of the northern margin by the Hunter Thrust, the uplift of the Blue Mountains plateau along the re-activated Lapstone line, and the formation of the Woronora Ridge by faulting and possible upwarping. The Cretaceous break-up of the continental margin leading to the rifting away of an eastern terrane, now on the Lord Howe Rise, must have left its mark, especially in the effects of a high geothermal gradient during the rift phase.

The basin history has resulted in the upper coal measures lying at minable depths in the Lake Macquarie Trough, the Hunter and Goulburn valleys, the Blue Mountains–Illawarra Shelf, and the Woronora Ridge.

Coal Deposits

The locations of currently operating (1984) mines, prospects, and colliery holdings are given in Plate 28. The most extensive mine developments have been in the Newcastle–Maitland–Cessnock and Wollongong districts, other important ones being in the Mittagong–Burragorang Valley, Lithgow, Ulan, and upper Hunter regions. Open-cut mines account for most of the production in the upper Hunter, while underground mines predominate in the rest of the Sydney Basin. A single mine operates in the Cranky Corner Basin. Before the turn of the century, there appears to have been some testing of the Clyde and Yarrunga Coal Measures, and Garretts seam, by adits. A colliery also operated early this century below Sydney Harbour at a depth of 900 m.

Greta Coal Measures

Lochinvar Anticline

The only coal currently being mined is from the Greta seam in the Cessnock district, where the seam has a maximum thickness of the order of 10 m. Most of the readily won coal to a depth of 300 m has been extracted, and future development must include exploitation of reserves deeper than this to the south, where, however, the seam thins to less than 3 m (Britten, 1975a). Potential reserves to depths of 700 m are of the order of one billion tonnes. The coal is very high in volatiles, low in ash, and relatively high in sulphur; it is used in coking blends and exported for the production of town gas. The Greta seam was also mined in the past along the western flank of the anticline, in areas where dips range from 20 to 60°.

The Homeville seam was worked near Kurri Kurri, where it is up to 8 m thick. The seam splits to the east and west, and because of roof conditions, mining of the splits has not been economic where they thin to less than 2–3 m.

Muswellbrook Anticline

This area has 5 to 6 seams, all within the Rowan Formation, three of which have been worked underground. In open cut mines, extraction of all the seams is possible, ash locally permitting. In the Bayswater No. 2 mine, coal forms about 35% of the Rowan Formation thickness. The Balmoral Coal Member, near the base of the section, ranges up to 14 m in thickness and has made mining economic in some mines.

The coal is high in volatiles, usually with low to medium ash, and moderate to high sulphur and phosphorus. Seam quality varies both laterally and vertically. Parts of the area are characterized by splitting of the seams, severe faulting, and widespread numerous intrusions of dolerite dykes and sills which have cindered the adjacent coal. These features will hamper mining development, particularly underground mining. The coals are chiefly used as high-grade thermal coals.

Cranky Corner Basin

Three seams are present in the 90–400 m thick sequence, of which only one, the 5.5 m-thick Tangorin seam, is worked; the others are either too thin or too high in sulphur and ash. The Tangorin coal is low rank, very high in volatiles, with very high fluidity and low ash, but also with an extremely high organic sulphur content. It has a limited use as thermal coal, and for blending with other coals. Current development is in the western

extremity of the basin. Trends of seam thickness and quality elsewhere in the basin are unknown, but Britten (1975b) has pointed out that a single bore about 460 m deep would help resolve this uncertainty.

Sedgefield and Belford Domes

In AOG Sedgefield 1, coal seams were intersected in the interval 77–474 m below ground level, which is at mineable depths. This well was not drilled on the highest point of the Sedgefield Dome, and the uppermost coal may lie at depths where it can be mined by open-cut methods, if the quantity and quality of coal justify it.

In AOG Belford 1, the coal-bearing interval lies deeper, 427–466 m below ground, but still at depths at which coal is mined in the Southern Coalfield. The two thickest seams at 435 m and 444 m, are interpreted as non-porous, clean coals on the basis of geophysical logs (Ozimic, 1968). Other seams above and below contain siltstone and fine sandstone.

The Camberwell Anticline and Loder Dome to the west have their uppermost coals too deep for present mining techniques.

The Sedgefield–Belford area does not seem to have been considered before as a coal prospect, and there are no cored drill holes or coal quality data available. If the demand for Greta-type coals continues, mining might commence here when the presently more economic reserves in the Lochinvar and Muswellbrook Anticlines are exhausted. A diamond drilling program to establish the coal type, quality and size of the resources would therefore be warranted.

Tomago Coal Measures

Mining of Tomago coal is confined to the East Maitland district, where currently five main seams are worked by both underground and open cut methods. In open cut operations, minor seams as thin as 0.3 m are also extracted. The coals have high volatile, moderate ash, and medium to high sulphur contents. They are used as thermal coals and in coking blends.

Dips over much of the area are about 4 or 5°, but local steepenings occur, and in the basal beds dips over 20° are not uncommon (Crapp, 1975). In the Mount Vincent Formation, below the unconformity, strata are generally disposed at 30–60°. Faulting is usually of a minor nature with very small displacements, rarely up to 6 m, and striking northwesterly. Dolerite sills and dykes are only sporadic.

In the Tomago area to the east, much of the outcrop is obscured by alluvium, and no mining has taken place to date. From drilling, it is known that 11 seams are present in a 450 m-thick sequence (Britten, 1972b). Although information is still inadequate for a detailed assessment, a considerable quantity of high-volatile coal suitable for coking blends is indicated (Crapp, 1975).

Wittingham Coal Measures

The complex multidirectional splitting and convergence of seams causes the number of seams in the sequence to vary from place to place. Production at present is from 15 seams. All yield high-volatile, bituminous coals, with low to medium ash and sulphur. Most are suitable for use in coking blends and as thermal coals, but the Bayswater and Ravensowrth coals have relatively low specific energies and are used for power generation, while the underlying Liddell and Barrett seams supply coal for coking. The Mt Ogilvie Fault separates coking coals to its east from non-coking types to its west (Stuntz, 1972b); the latter have potential for the production of synthetic liquid fuels. Open-cut mining now predominates over underground mining. Most of the coal not used for power generation is exported. The Wittingham Coal Measures have 11 988 Mt of measured and indicated reserves, of which 51% are recoverable (Joint Coal Board, 1984).

Dolerite intrusion is prevalent between Broke and the southern nose of the Muswellbrook Anticline near Jerrys Plains, as well as in the vicinity of Mt Ogilvie. Dips are usually less than 15°, most commonly less than 5°, but locally, as in the Mt Thorley Monocline, can exceed 45°. Mining is affected by the complex seam splitting, and by differential compaction folding around coarse-grained channel deposits. Some seams, such as the Piercefield seam, are commonly characterized by claystone bands which probably originated as ash-fall tuffs, and these contaminants have to be removed by washing from the raw mined product. Selective mining of coking and thermal coal from different levels in the same seam is carried out in some collieries.

Illawarra Coal Measures

Western Coalfield

The seams being mined in the Western Coalfield are the Lithgow, Lidsdale, and Katoomba seams, and in the north, the Ulan seam, which is the equivalent of the Lithgow and Bayswater seams. Underground mining predominates. The Lithgow and Lidsdale seams have high volatile, medium to high ash, and low sulphur contents. The Lithgow seam averages 3 m in thickness, but ranges to over 7 m where it has converged with the Lidsdale seam.

The Lidsdale by itself ranges to over 2 m thick. They are used mainly as thermal coals, but can be used also in coking blends. The Ulan seam is 13 m thick, and has high volatile coal with low to moderate ash and sulphur; it too is used as thermal coal. The Katoomba seam, lying at the top of the coal measures, is normally up to 3 m thick, but can range to over 4 m. It has medium volatile thermal coal, with medium to high ash, but very low sulphur. The Lithgow seam deteriorates down-dip to the east, but some of the overlying seams improve in quality in that direction. Other seams not being mined, but with economic potential, include the Irondale (Wolgan) seam (up to 2.3 m thick, with good coking coal), and the Middle River seam (up to 20 m thick, but with much interbedded sediment). The latter, although high in ash, could locally be worked to yield a good coking fraction (Morris, 1975); the normal section of commercial interest, at the base of the seam, would only be up to 2.5 m thick, but in places could range up to 4 m. About 1390 Mt of measured and indicated reserves exist, of which 68% are recoverable (Joint Coal Board, 1984).

As the area has formed a stable shelf, the degree of folding and faulting is minimal. The regional dip, easterly near Newnes Junction and northeasterly elsewhere, is quite low, and is generally less then 4°. Faulting is small-scale, the largest displacement observed being 5 m. There are, however, a number of submeridional zones of fault and joint swarms, related to basement fractures, within which roof failures occur if mining proceeds through them (Shepherd & Huntington, 1981). A number of small reverse faults have throws of less than 0.3 m. Igneous intrusions are rare in the Lithgow area, but there is an appreciable increase northwards towards Rylstone, and between Rylstone and Putty numerous breccia vents and basalt plugs occur (Bradley & others, 1984).

Southern Division

Coal is being produced from four seams by underground mines, chiefly from the three main seams in the upper part of the coal measures (the Bulli, Balgownie, and Wongawilli seams), but also from the Tongarra seam. It is unlikely that in the foreseeable future any other seam will be exploited, because unacceptably high ash yield, and/or low thickness, make them uneconomic. The three upper seams have medium to high ash, and low or very low sulphur levels, but vary in volatile content. Balgownie and Bulli coals from the South Coast have low-to-medium or low volatile contents, and are prime coking coals. Bulli coal from the Burragorang Valley (the only coal mined there) is medium volatile with good coking properties. Wongawilli coal is also medium-volatile coking coal, and is ideally suited for blending in large proportions with high-rank coking coal. The Tongarra seam supplies strongly coking coal, with low to medium volatile, medium to high ash, and moderate sulphur contents. Much of the coal is used in the steel industry, and most of the remainder is exported. The region holds 3251 Mt of measured and indicated reserves, of which 58% are deemed recoverable (Joint Coal Board, 1984).

Generally, regional dips are 2° or less along the South Coast (but locally 5° or more), while in the Burragorang Valley the dip is about 4°. Faulting is not intense and is commonly associated with folding, and many are growth faults. The major faults occur along the coast, the maximum throw being about 90 m (Wilson, 1975). Exceptions are the Nepean and Oakdale Faults near the Lapstone line, which have displacements of about 100 m (McLean & Wright, 1975).

Igneous intrusions occur as dykes, sills, and plugs of dolerite, monchiquite, and camptonite. Northwest trends of dykes are the rule. Near Mittagong, laccoliths and sills of syenite are present, which have caused extensive destruction of coal in several localities. Dykes, usually less than 5 m wide, range up to 15 m wide, but most have had little cindering effect on the coal seams. However, dykes that have not been altered to clay cause problems for longwall mining equipment, which requires large uninterrupted blocks of coal, and can result in loss of recoverable reserves and standstills in production (Bos, 1980). Mining problems which affect the Southern Division more than other coalfields in the basin are bad roof conditions, stone rolls, gas emissions, and rock bursts. Some of these problems are exacerbated by mining to depths of 500 m. On the other hand, seams do not display splitting and coalescence, or erratic stratigraphic variations, and the coking coals produced are the best in the state.

Newcastle Coal Measures

Production in the Newcastle Coalfield is currently from the three uppermost seams, and from six seams in the basal Lambton Subgroup. Of the latter, two seams are the result of the coalescence. Most of the coal is won by underground mining.

The seams in the Lambton Subgroup (the Borehold, Yard, Dudley, and Victoria Tunnel seams, and their coalesced equivalents to the west), consist of high-volatile coking coals with medium to high ash and low sulphur contents. By themselves, they yield acceptable but relatively weak cokes. They are important as the base of the coking blend used in the local steel industry. The three seams at the top of the Newcastle Coal Measures (the Fassifern, Great Northern and Wallarah seams) have a higher inertinite component, and constitute high-volatile thermal coals with medium to high ash and very low sulphur. They are

valuable as the main source of thermal coal for power generation in the Newcastle district.

In the past, other seams that have been exploited include the Nobbys seam in the Lambton Subgroup, and the Australasian seam in the middle of the coal measures. The latter can produce a coking fraction suitable for blending. Four further seams from the middle of the sequence have been worked on a small scale.

The dominant structural feature of the field is the Macquarie Syncline, in which dips are generally up to 4°, but reach 15° near conglomerate lenses owing to differential compaction. Faults usually have throws of less than 6 m (15 m in rare cases), and most trend northwesterly. Dolerite dykes and some sills are present, but do not pose serious mining problems.

Wollombi Coal Measures

There is currently no extraction of coal from the Wollombi Coal Measures. The little exploration that has been carried out indicates that, at shallow depths, the coals have a lower rank than those of the Newcastle Coal Measures, suggesting that the seams cannot be economically worked at present because of numerous thick dirt bands.

Two exceptions may be the uppermost seams, the Greigs Creek and the underlying Hillsdale seam. The 2 m-thick Greigs Creek seam has been worked in the past for thermal coal which has low to medium ash and low sulphur. Drilling has disclosed that at depths of 700 m the rank increases and the coal exhibits coking properties. The Hillsdale seam consists of thermal coal with similar properties to that in the Great Northern seam of the Newcastle Coal Measures (Britten, 1975b).

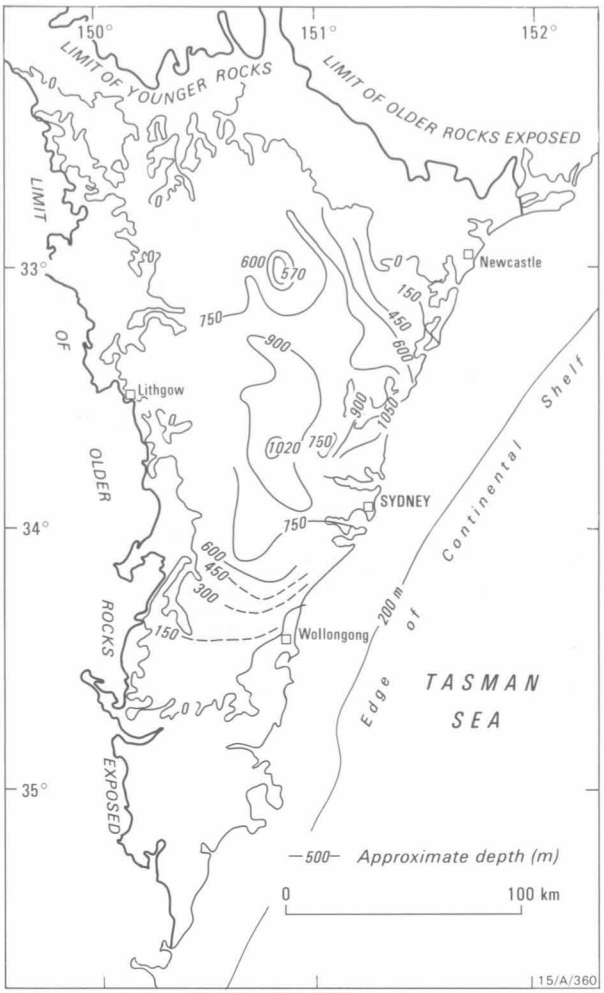

Fig. 3–9. Depth of overburden above Newcastle Coal Measures and correlatives (from fig. 61 of Mayne & others, 1974).

Future Prospects

Onshore resources

The coal resources of the Sydney Basin are immense: the Joint Coal Board (1984) estimates the in situ inferred resources as 377 617 Mt. However, most of this coal lies deeper than 600 m, the current practicable limit on mining. Figure 3–9 indicates where this limit occurs with respect to the top of the upper coal measures, but it must be borne in mind that most seams lie even deeper. Coal was won from a depth of about 900 m below Sydney Harbour between 1902–1931 (Stuntz, 1975b), but mining at this depth proved costly. The deep coals, which tend to have good coking qualities, will remain unexploited as long as shallower deposits can be worked more economically elsewhere. Mining will therefore continue to be restricted to the northeastern, northern, western, and southern marginal regions for some time to come. Technological change, such as underground coal gasification (UCG) and robot mining, could conceivably change this, but is unlikely in the immediate future.

Inferred in situ resources at less than 600 m depth are estimated as 260 000 Mt, of which 46% are considered recoverable. 3500 Mt (88% recoverable) consist of measured and indicated reserves lying at less than 200 m and of open cut potential (Joint Coal Board, 1984).

Offshore potential

Limited undersea mining extensions from land-based collieries have demonstrated that the upper coal measures continue below the continental shelf, and that there are no untoward problems in mining within short distances of the coast (Bowman, 1981). Mining under the ocean in New South

Wales is allowed only where the minimum cover between the workings and the sea floor is 36.6 m, and first workings only are permitted unless the depth of cover exceeds the thickness of coal by a factor of 60.

Because of problems with ventilation and transport, undersea mining from onshore would be restricted to within 6–7 km of the coast. Beyond this distance, techniques involving artificial islands of waste material, constructed around offshore platforms and ventilation shafts, would have to be used. Exploration for coal on the continental shelf will be costly.

Very little is known about the size of the offshore resources, but Bowman (1981) has attempted speculative estimates as guides to what coal may be present, and substantial resources are suggested. Off Newcastle, reserves within 6 km of the shore with a cover of between 40 to 600 m amount to about 2600 Mt of coking and thermal coal, whereas off the South Coast, 400 Mt are estimated, making a total of 3000 Mt mineable by present technology. Reserves at similar depths, more than 6 km from the shoreline and probably mineable in the near future, total about 23 000 Mt. Reserves at depths greater than 600 m amount to about 2000 Mt.

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CHAPTER 4

Gunnedah Basin[1]

by
D.S. Hamilton, J. Beckett, & C.R. Weber

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1 Most of the information has been published by Beckett, J., Hamilton, D.S., & Weber, C.R., 1983 (see Selected Bibliography), except for the Basin Structure section.

Introduction

The Gunnedah Basin is situated in the Narrabri–Coonabarabran–Murrurundi region of northern New South Wales (Fig. 4–1). Early accounts of coal in the region include reports by David (1887), Carne (1908), and Harper (1926). Kenny (1929, 1964) modelled the post-Carboniferous rocks with a particular interest in their underground water-bearing potential. Hanlon (1948a, b; 1949a, b, c; 1950a, b) gave details of the rock outcrops from Narrabri to Willow Tree, and defined some basic stratigraphic units. Britten & Hanlon (1975) later divided the Black Jack Formation into members and presented an idealized stratigraphic column.

Bourke & Hawke (1977) reported on a Department of Mineral Resources scout-drilling program in the Narrabri–Weetaliba area. They correlated the units with formations on the eastern side of the Surat Basin. McDonald (1976) and Winward (1978) compiled basic data on Departmental scout-drilling programs in the Gunnedah–Boggabri and Breeza–Caroona districts, respectively. Russell (1981) summarized the stratigraphy and structure, and Tadros (1982) reported on a drilling program at Boggabri.

In 1981, the N.S.W. Department of Mineral Resources commenced a regional coal exploration drilling program of 62 holes, involving 31 000 m of cores in holes up to 990 m deep.

Stratigraphy and Sedimentation

Bembrick & others (1973) described the Gunnedah Basin as a structural unit, separated from the Sydney (structural) Basin to the south by the Mount Coricudgy Anticline and from the Bowen Basin to the north by a structural high north of Narrabri. The Gunnedah Basin has rocks of Permian and Triassic age, forming the northern part of the Sydney (depositional) Basin (Figs 4–2 and 4–3).

Rocks of Jurassic age unconformably overlie the Permo-Triassic sequence, and belong to the Surat Basin portion of the Great Australian Basin.

Basal Volcanics

The oldest rocks, intersected in all but the northern and westernmost coal and petroleum exploration holes, are undeformed volcanic lavas and tuffs beneath the Early Permian coal measures. Acid volcanics are present in some areas; in others the volcanics are of intermediate to basic composition.

The acid volcanics can be correlated with the Boggabri Volcanics (Hanlon, 1950a), which crop out along the eastern margins of the basin. The intermediate to basic volcanics are perhaps equivalent to the Early Permian Werrie Basalt, which crops out in the Werrie Basin to the east.

The upper part of the basal volcanics have a thick weathering profile, including a palaeosol locally. The volcanics were not fully penetrated by the drilling.

Leard Formation

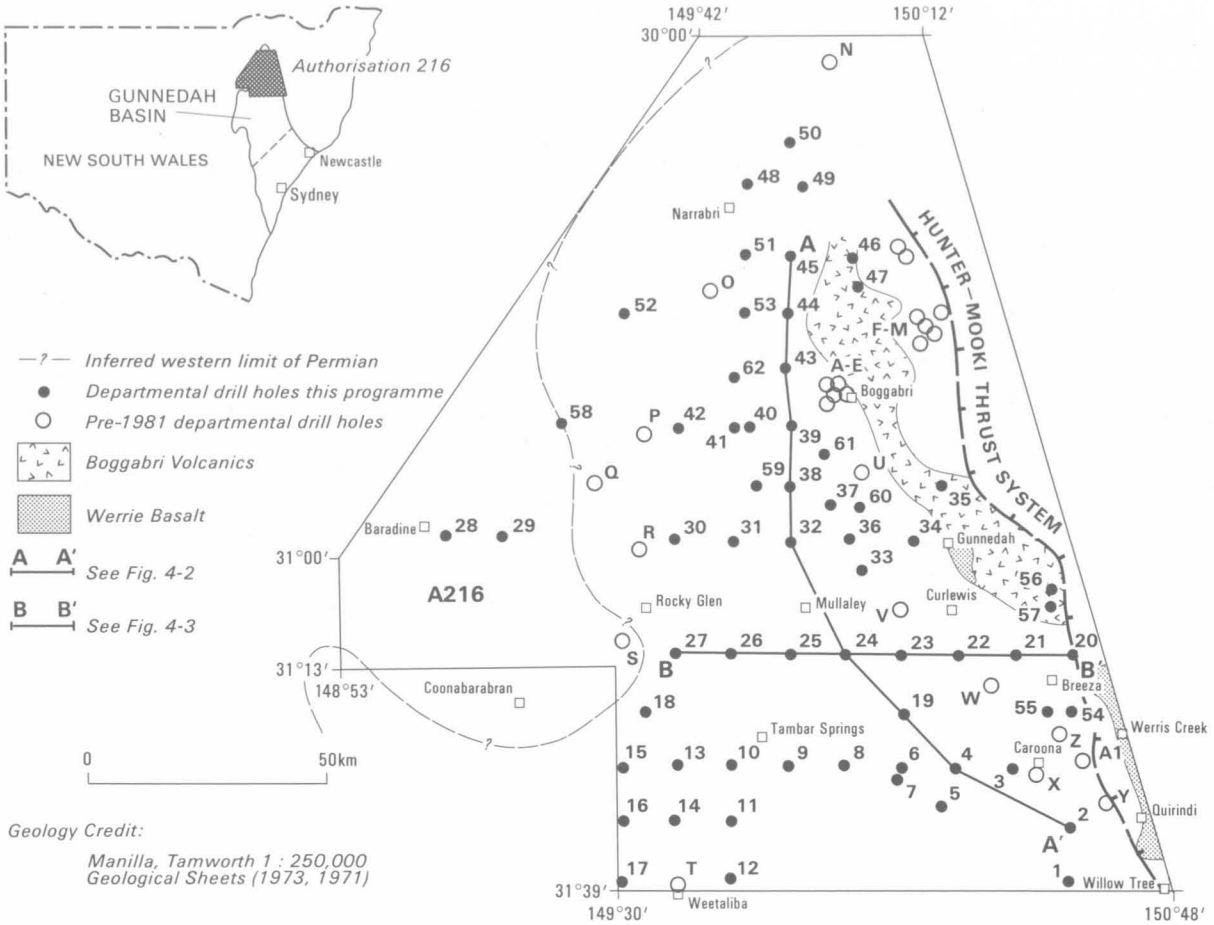
A grey and grey-brown pelletoidal clayey sandstone and conglomerate (i.e., composed of sand- and pebble-sized clay rock fragments), up to 32 m thick, rests unconformably on the weathered basal volcanics. Tadros (1982) correlated this unit with the Early Permian Leard Formation, a similar sequence east of Boggabri; described by Brownlow (1981).

In many places, it is very difficult to distinguish between the pelletoidal clayey sandstone and the underlying weathered lava, which suggests that the clay sandstone is epiclastic and in part colluvial.

Loughnan (1973, 1975) investigated Early Permian pelletoidal clayey sandstone sequences from the Sydney and Gunnedah Basins and concluded that they are kaolinitic flint clays derived from lateritic weathering profiles on basalt. He suggested that the pellets formed colluvial deposits, redistributed across an alluvial plain.

Maules Creek Formation

Brownlow (1981) defined the Early Permian Maules Creek Formation, which crops out on the eastern side of the Boggabri Ridge, as comprising a sequence of lithic conglomerate, sandstone, siltstone, claystone and coal. The formation is up to 1000 m thick and has from 15 to 20 potentially economic coal seams. Runnegar (1974) suggested that this part of the Maules Creek Formation developed as a clastic wedge, with sediments derived from uplifted terrane east of the Hunter–Mooki Fault system.



Geology Credit:

Manilla, Tamworth 1 : 250,000 Geological Sheets (1973, 1971)

DEPARTMENT OF MINERAL RESOURCES FULLY CORED DRILLHOLES, 1981-1982 REGIONAL PROGRAM

1 *DM Parsons Hill DDH 1*
2 *DM Gunnadilly DDH 1*
3 *DM Doona DDH 1*
4 *DM Springfield DDH 1*
5 *DM Rodd DDH 1*
6 *DM Coolanbilla DDH 1*
7 *DM Coolanbilla DDH 2*
8 *DM Trinkey DDH 1*
9 *DM Bomera DDH 1*
10 *DM Wilson DDH 1*
11 *DM Saltwater DDH 1*
12 *DM Napier DDH 1*
13 *DM Tinkrameanah DDH 1*
14 *DM Cookabingie DDH 1*
15 *DM Terrawinda DDH 1*
16 *DM Ulinda DDH 1*
17 *DM Morven DDH 1*
18 *DM Purlawaugh DDH 1*
19 *DM Howes Hill DDH 1*
20 *DM Texas DDH 1*
21 *DM Curlewis DDH 1*
22 *DM Digby DDH 1*
23 *DM Goran DDH 1*
24 *DM Goran DDH 2*
25 *DM Bando DDH 1*
26 *DM Nombi DDH 1*
27 *DM Bulga DDH 1*
28 *DM Worigal DDH 1*
29 *DM Hall DDH 1*
30 *DM Brigalow DDH 2*
31 *DM Brigalow DDH 1*
32 *DM Coogal DDH 1*
33 *DM Millie DDH 1*
34 *DM Gunnedah DDH 1*
35 *DM Yarrari DDH 1*
36 *DM Benelabri DDH 1*
37 *DM Benelabri DDH 2*
38 *DM Denison DDH 1*
39 *DM Walla Walla DDH 1*
40 *DM Parkes DDH 2*
41 *DM Parkes DDH 1*
42 *DM Dewhurst DDH 1*
43 *DM Tullamullen DDH 1*
44 *DM Turrawan DDH 1*
45 *DM Turrawan DDH 2A*
46 *DM Eulah DDH 1*
47 *DM Wallah DDH 1*
48 *DM Narrabri DDH 1*
49 *DM Killarney DDH 1*
50 *DM Narrabri DDH 2*
51 *DM Blake DDH 1*
52 *DM Dampier DDH 1*
53 *DM Gorman DDH 1*
54 *DM Ferrier DDH 1*
55 *DM Ferrier DDH 2*
56 *DM Dight DDH 1*
57 *DM Dight DDH 2*
58 *DM Arrarownie DDH 1*
59 *DM Denison West DDH 1*
60 *DM Bendelabri DDH 3*
61 *DM Walla Walla DDH 2*
62 *DM Parkes DDH 3*

DEPARTMENT OF MINERAL RESOURCES PRE-1981 DRILLHOLES

A-E *DM Boggabri DDH'S 1-5*
F-M *DM Maules Creek DDH'S 1-8*
N *DM Moema DDH 1*
O *DM Jacks Creek DDH 1*
P *DM Galloway RDH 1*
Q *DM Tunmallallee DDH 1*
R *DM Borah DDH 1*
S *DM Yaminba DDH 1*
T *DM Weetaliba DDH 1*
U *DM Emerald Hill DDH 1*
V *DM Wondobah DDH 1*
W *DM Breeza DDH 1*
X *DM Caroona DDH 1*
Y *DM Caroona DDH 2*
Z *DM Caroona DDH 3*
A1 *DM Caroona DDH 4*

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Fig. 4–1. Borehold location plan–Authorisation 216.

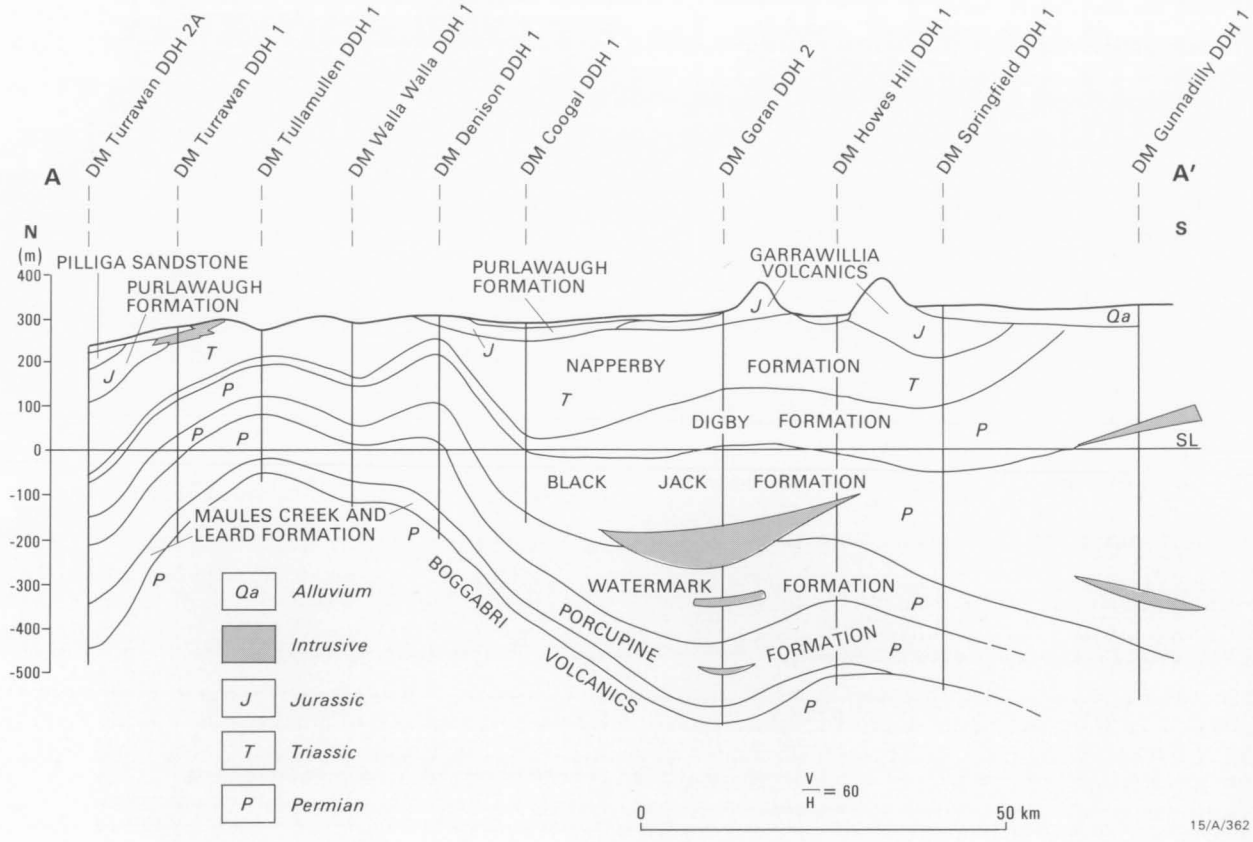

Fig. 4–2. Gunnedah Basin, stratigraphic correlation: section A-A, Fig. 4–1.

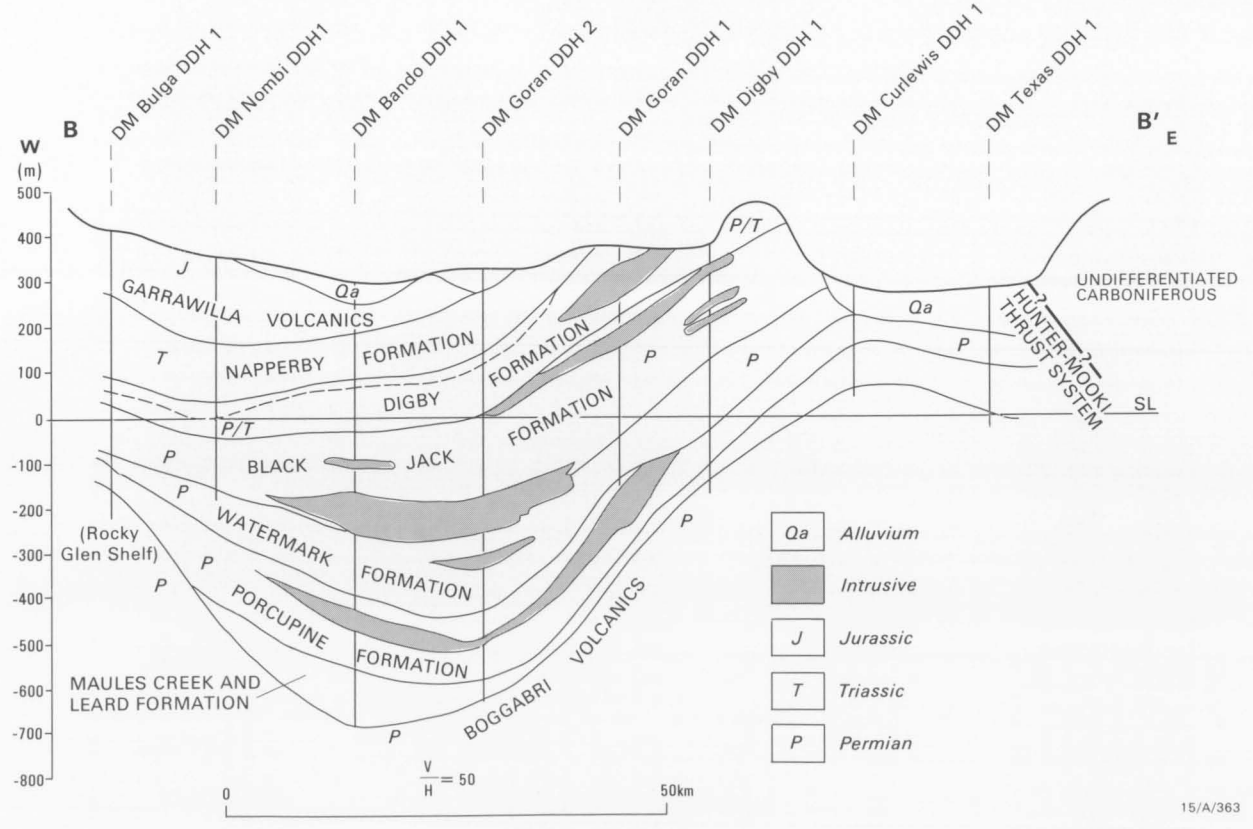

Fig. 4–3. Gunnedah Basin, stratigraphic correlation: section B-B, Fig. 4–1.

West of the Boggabri Ridge, the Leard Formation is conformably overlain by a non-marine sequence of sandstone, conglomerate, siltstone, and up to five coal seams. The lower part of the sequence locally has pelletoidal clayey sandstone beds. The sequence, equivalent to the Maules Creek Formation, reaches a maximum thickness of 125 m in the central part of the basin. It is best developed in three districts: near Curlewis, at depths of around 500 m, near Mullaley at about 900 m, and south of Narrabri at 300–400 m (Fig. 4–4).

This formation appears to have been deposited on an extensive marshy coastal plain which, with time, became increasingly deltaic in character. The lower part of the formation has carbonaceous claystone interbedded with pelletoidal clay sandstone and minor coal. This succession passes upwards into a series of upward-fining cycles of sandstone, siltstone/sandstone laminite and coal. In each cycle, the sandstone, which ranges from 5 m to 15 m in thickness, was deposited in distributary channels. This series of cycles grades upwards into siltstone/sandstone laminite, which commonly displays ripples and fine cross-bedding, and has coaly fragments. It may represent channel-fill and overbank material. The laminite is commonly overlain by coal, generally less than 2 m thick.

Conglomerate becomes dominant towards the top of the formation and is typically moderately sorted, and composed of acid volcanic clasts.

Coal seams within the formation are generally interrupted by conglomerate and sandstone channel deposits before reaching economic thicknesses. They may well prove to be discontinuous. They are commonly pyritic, probably as a result of the encroaching marine conditions of the overlying Porcupine Formation.

Porcupine Formation

Hanlon (1949a) defined the Porcupine Formation as a marine sequence of sandstone and conglomerate, with subordinate shale and limestone. Palynological evidence (McMinn, 1981a, b; 1982a, b, d) suggests that the unit is Late Permian in age.

Where the underlying Maules Creek Formation is present, the basal contact of the Porcupine

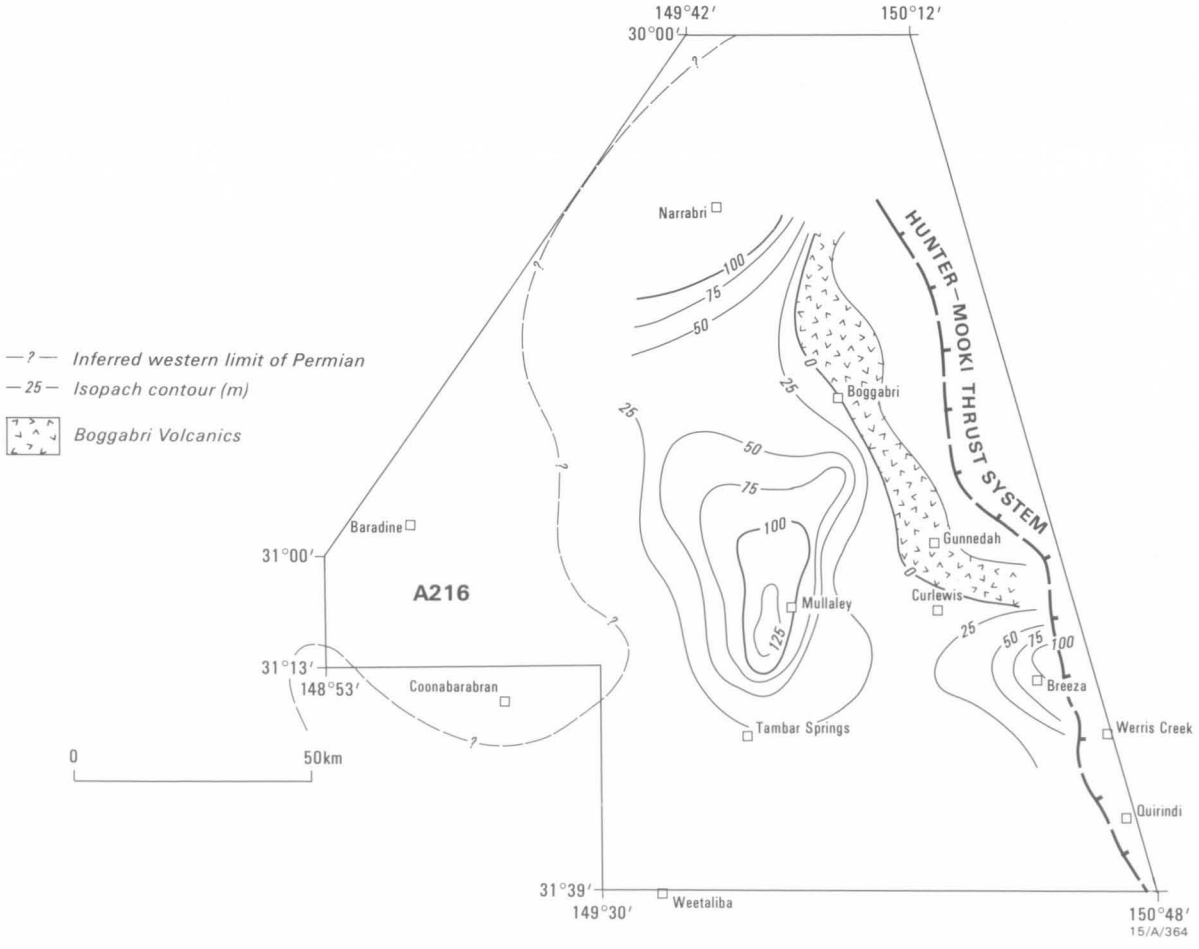

Fig. 4–4. Isopachs of Maules Creek Formation. (See Fig. 4–1.)

Formation is conformable. In places, the formations interfinger, probably with reworking of the upper part of the Maules Creek Formation.

Deposition of the Maules Creek Formation ceased when the alluvial plain was inundated by a major marine transgression, probably coming from the south. The Porcupine Formation, which was deposited during this transgression, is up to 160 m thick and consists of silty lithic sandstone and conglomerate with minor siltstone. Overall, it is poorly sorted and sedimentary structures are sparse.

Bioturbation is strongly developed throughout the unit and may have destroyed most of the pre-existing structures. Subrounded acid volcanic erratics up to 0.4 m in size occur throughout. (Such erratics are more commonly known as "dropstones" and are generally believed to have been transported by fluvial or marine ice.) The predominantly acid volcanic composition of the formation and its pronounced westward thinning suggests a source in the (then) New England Volcanic Arch to the east.

The lower half of the formation is dominated by conglomerate, which was perhaps formed from material transported by rivers to a marine shelf and deposited as a series of fan deltas. It is possible that many of the larger clasts were brought by river ice during winter, rafted off-shore, and then released during thawing (McClung, 1980, p. 71).

The upper half of the Porcupine Formation consists mainly of bioturbated silty sandstone, typically with dropped pebbles. It probably represents a distal facies of the underlying fan deltas.

Watermark Formation

The Watermark Formation conformably overlies the Porcupine Formation with a gradational contact. Hanlon (1949b) defined the former in the Breeza district, where it comprises shales and interbedded limestone. The Watermark Formation has a maximum thickness of 220 m near Breeza and thins gradually westward.

The Watermark Formation consists of siltstone, claystone, silty sandstone, and siltstone/sandstone laminite. No biogenic or primary chemical limestone has been recognized, but "cone-in-cone" calcite replacement zones up to 0.7 m thick are common. Glendonites, brachiopods, bioturbation, and spinose acritarchs throughout the unit attests to its marine character.

The Watermark Formation represents an initial transgression from shallow-marine to deeper prodelta conditions, followed by a regression to a shallow-marine delta front. The initial transgression probably came from the south through the adjacent Sydney (structural) Basin. However, the regression was caused by a large prograding major deltaic system, which came from the east and north.

The lower (transgressive) part of the Watermark Formation is an upward-fining sequence of sandy siltstone, dark grey siltstone, and claystone. Fossil zones, some with shells and others with bryozoans, are common. Dropped pebbles, similar to those in the underlying Porcupine Formation, are widespread near the base, but decrease in abundance higher in the sequence. The sandy siltstone is intensely burrowed, suggesting it was deposited under shallow-marine conditions. In contrast, the overlying siltstone and claystone display fine parallel laminations. Sedimentation therefore was entirely from suspension and it is concluded that they formed in a pro-delta, in relatively deep water unaffected by marine currents. Bioturbation is poorly developed and consists chiefly of horizontal feeding burrows. Glendonites and ice-rafted dropstones in this siltstone and claystone unit indicate that the cold conditions which prevailed at the time of the Porcupine Formation continued into the lower part of the Watermark Formation.

The upper (regressive) section of the Watermark Formation has a coarsening-upward sequence of grey laminated siltstone, silty sandstone, and siltstone/sandstone laminite. These rocks and the claystone of the underlying unit form a typical regressive sequence from prodelta muds to delta-front laminites. The silty sandstone is fine-grained and strongly bioturbated. The laminite commonly displays wave and current-induced structures, including fine cross-bedding and ripples. Sparse bioturbation occurs as sand-infilled burrows, which disrupt the laminations.

The amount of sandstone, as well as its grain-size, increases towards the top of the formation. The upper boundary of the Watermark Formation, in some places, interfingers with non-marine deltaic sandstone of the Black Jack Formation.

Black Jack Formation

Hanlon (1949a) defined the Black Jack Formation as a sequence of sandstone, shale, conglomerate, chert, and thin bands of limestone and coal. Both he and earlier workers found difficulty in determining the boundary between the coal measures and the underlying shales.

Figure 4–5 shows isopachs of the Black Jack Formation, which maintains a thickness of about 200 m in the Gunnedah–Curlewis and Breeza areas, thickening to over of 450 m in the south near Quirindi.

The Black Jack Formation originated in a major deltaic system which prograded across the marine strata of the Watermark Formation. A number of sedimentary facies can be recognized within the Black Jack Formation and these are useful for correlation across the basin.

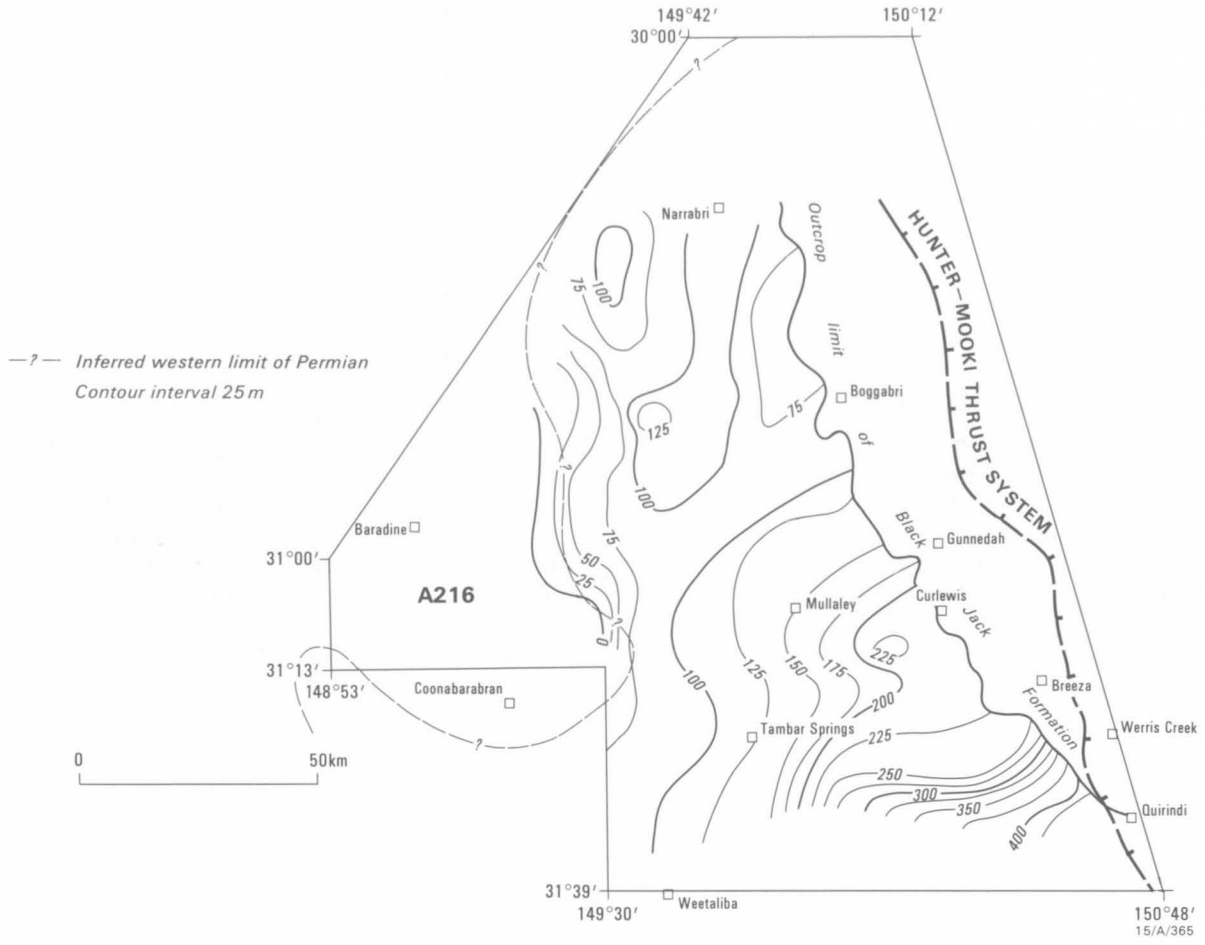

Fig. 4–5. Isopachs of Black Jack Formation. (See Fig. 4–1.)

Lower delta plain facies

The delta front laminites at the top of the Watermark Formation are conformably overlain by a prograding lower delta plain facies. Palynological evidence indicates that deposition took place earlier in the northern part of the basin than in the south (McMinn, 1981a, 1982a). (The top of the underlying Watermark Formation is thus diachronous and represents a regression, occurring as the delta system prograded from the east and north.)

The lower delta plain facies consists of siltstone, carbonaceous claystone, quartz–lithic sandstone, interbedded siltstone and sandstone, and coal seams. The coal seams are at least in part equivalent to the Melvilles Coal Member (Britten & Hanlon, 1975). The interbedded siltstone and sandstone may be shallow bay-fill material, commonly displaying ripples produced by tidal currents and wind over shallow bays.

The quartz–lithic sandstone accumulated as distributary mouth bars and in distributary channels in the delta. The distributary channel sandstone has a sharp erosional lower contact, has "rip-up" siltstone intraclasts, and is overall upward-fining. The sandstone of the distributary mouth bars contains coarsening-upward cycles.

Shallow marine facies

Deposition of the lower delta plain facies was followed by a short-lived transgression which resulted in widespread, shallow-marine shelf conditions. Siltstone/sandstone laminite up to 15 m thick accumulated at the peak of the transgression. It is generally overlain by the Arkarula Sandstone Member (Britten & Hanlon, 1975), the top of which formed an extensive plain as the marine setting regressed. The Arkarula Sandstone Member is an important marker horizon, and also has the palynological boundary between Lower Stage 5 and Upper Stage 5 (McMinn, 1982a, b, c). It is thus time-equivalent throughout the basin.

The Arkarula Sandstone Member is from 1 m to 15 m thick and is typically a strongly bioturbated silty sandstone with subvertical mudlined burrows. Spinose acritarchs are present in microflora. Although evidence of significant wave or current

activity is absent, a shoreline setting is envisaged for the Arkarula Sandstone Member. The lack of significant wave-induced structures may be due to the intense bioturbation. In the northern part of the region, the unit is very pebbly, probably as a result of streams from a northern hinterland depositing coarse-grained material as fans onto the shelf.

Hoskissons Coal Member

The Arkarula Sandstone Member is conformably overlain by the Hoskissons Coal Member (Britten & Hanlon, 1975), consisting of coal and carbonaceous siltstone from 2 m to 18 m thick. The Hoskissons Coal Member formed in a vast lower delta coal swamp which developed on the extensive plain by the marine regression. It can be correlated with the Lithgow Coal and Ulan seam in the Western Coalfield and the Bayswater Coal Member in the Hunter Valley. An outstanding feature of the Hoskissons seam is its contemporaneousness throughout the basin.

Upper delta plain facies

The Hoskissons Coal Member is overlain by an upper delta plain facies, which includes the Wondoba Coal Member (Britten & Hanlon, 1975), several unnamed coal seams, interbedded siltstone and sandstone, channel-filling white quartz sandstone, and minor tuffaceous sediments. The facies is best developed between Gunnedah and Mullaley and to the south. It is not present north of Boggabri where the delta plain was covered by conglomerate of the Digby Formation much earlier than in the south.

The interbedded siltstone and sandstone represent mainly overbank and levee deposits. The sandstone is fine-grained and commonly displays climbing ripples. The siltstone is grey and the bedding is disturbed by intensive root penetration. Wisps of coaly material are abundant throughout this unit.

A white quartz sandstone up to 12 m thick occurs quite commonly within the facies in the Curlewis–Breeza area. However, in other areas more than one such sandstone is present in the sequence, but not necessarily in the upper delta plain facies. These units are interpreted as channel deposits because they typically display a sharp erosional base and fine upwards. In several places, channels appear to have eroded the top of an underlying seam. These channel sandstones are much more quartz-rich than the other sandstone in the Black Jack Formation. One explanation for this difference is that the channels have a different (perhaps westerly) source area; another is that the sands in the channels were reworked, resulting in depletion of less-resistant lithic grains. Waters (1971) named one of these units the Clare Sandstone Member from outcrop in the Gunnedah area.

A highly burrowed interval of interbedded siltstones and sandstone, up to 5 m thick, occurs towards the middle of the facies. It is associated with the *Microreticulatisporites bitriangularis* palynological subzone (McMinn, 1982a) and is possibly an extension of the marine incursion in the Sydney Basin responsible for the Denman Formation.

Tuffaceous sediments occur near the top of the facies. They typically have fine white and grey laminations, well-preserved *Vertebraria*, and a thin zone of climbing ripples.

Tuffaceous stony coal facies

The upper delta plain facies is overlain by a facies characterized by stony coal, irregularly interbedded with massive tuff (often with dewatering structures, among others) and laminated (transported-reworked) tuffaceous claystone. The Goran Conglomerate Member (Beckett & others, 1983) is a moderately sorted, granule to pebble conglomerate, which is near the base of this tuffaceous stony coal facies. It is a widespread fluvial fan conglomerate, and represents the first pulse of the coarse terrestrial sedimentation, ultimately covering the delta plain and terminating the development of coal swamps. It is similar in composition to conglomerate of the Digby Formation, but is better sorted and finer-grained.

The tuffaceous stony coal facies has a similar distribution to the underlying upper delta plain facies and, like it, is thickest in the Quirindi region. The coal seams in this facies characteristically have white to light-green tuffaceous bands and tend to be stony. Browlow & others (1979) have suggested that the tuffaceous sediments were derived from tephra ejected from volcanoes in the (then) New England Volcanic Arch to the east. Byrnes (1982), examining thin sections, also concluded that they were derived from contemporaneous tephra.

Digby Formation

The Black Jack Formation was terminated by the deposition of the terrestrial Digby Formation, a conglomerate unit in the Gunnedah–Curlewis

area, which Kenny (1964) termed the "Digby Beds". (There is neither an unconformity between the two formations, nor is there an apparent erosional surface; see below.) The Digby Formation appears to be a major series of coalesced conglomerate fans which inundated and buried the coal swamp delta plain in Late Permian times from source areas mainly to the east, within the (then) New England Volcanic Arch. It is from 15 m thick in the Narrabri region to more than 200 m in the Quirindi region.

In the lower half of the Digby Formation in the Narrabri–Gunnedah area, overlapping and coalescing alluvial fans have been formed mainly by debris flow. The latter mechanism is suggested because the conglomerate is typically unstratified and poorly sorted. Furthermore, the lack of erosion or reworking of the underlying coal measures is consistent with debris flow, but not so with fluvial deposition. Individual fans are from 10 to 45 m thick. They represent a proximal facies of the Digby Formation. Debris-flow was followed by stream deposition of conglomerate, which shows better sorting and stratification, as well as an upwards-increasing proportion of minor interbedded sandstone. Recent evidence suggests that in some places the upper part of the Digby Formation may be Early Triassic in age (A. McMinn pers. comm.)

In the southeast and southwest (near Quirindi and Coonabarabran), the more distal parts of the Digby Formation have only fluvial conglomerate, with thickly bedded sandstone dominant towards the top. This facies pattern may extend farther south into the Ulan area where the distal facies of the Digby Formation appears to be equivalent to the Triassic Wollar Sandstone.

The boundary between the Black Jack Formation and the Digby Formation is conformable because:

(1) Palynological evidence shows that the upper part of the Black Jack Formation and the lower part of the Digby Formation have assemblages equivalent to the late Permian *Microreticulatisporites bitriangularis* subzone (McMinn 1982a, c; and pers. comm.).
(2) The lower part of the Digby Formation commonly has a coaly sequence up to 10 m thick, locally with one or two coal seams developed. This sequence is lithologically similar to the underlying (Permian) tuffaceous stony coal facies.
(3) There is no evidence that the top of the Black Jack Formation was eroded or weathered prior to deposition of the Digby Formation; for example, there is no evidence of reworking of coal measures sediments (no rip-up clasts, etc.) in the basal Digby Formation.

The conglomerate on the Black Jack Formation is time-transgressive and may have commenced in the north and east, prograding slowly across the basin. In the north, it rests conformably on top of the Hoskissons Coal Member, while farther south it was deposited on stratigraphically higher units of the Black Jack Formation. In the central part of the basin, the conglomerate overlies a thin section of the tuffaceous stony coal facies, while farther to the south it overlies a much thicker sequence of tuffaceous stony coal and upper delta plain facies.

Napperby Formation

The name "Napperby Beds" was applied by Kenny (1964) to a Triassic siltstone–sandstone sequence which crops out north of the Oxley Highway to the west of Mullaley. Beckett & others (1983) referred to this unit as the Napperby Formation.

In some places, the Napperby Formation disconformably overlies the proximal conglomerate of the Digby Formation. However, locally, where the Napperby Formation overlies the distal sandstone of the Digby Formation, the boundary appears to be gradational. The Napperby Formation ranges from 25 m tp 215 m in thickness. Large variations in thickness are present since the upper contact of the unit is commonly eroded.

The Napperby Formation has three units reflecting changes in the depositional environment, namely from brackish and bay to tidal flat, and then to deltaic conditions. The basal unit is characteristically composed of a finely laminated dark grey siltstone, from 5 m to 30 m thick. The presence of acritarchs (Morgan, 1975) and siderite (replacing authigenic pyrite or marcasite nodules) indicates that the unit formed in a restricted nearshore marine environment, such as a bay or a coastal lagoon.

The basal siltstone grades slowly upwards into a sandstone/siltstone laminite, which may have been deposited in tidal flats. The laminite is silty at the base, grading to sandy towards the top, with flasers of siltstone in fine-grained, rippled and finely cross-bedded sandstone. It has variable degrees of bioturbation, mainly as horizontal burrows and grazing trails. Mudcracks are widespread towards the top of the laminite unit. This top also commonly has individual beds of rippled and finely cross-bedded sandstone up to 1.5 m thick. These may have formed in shallow channels draining tidal flats.

The siltstone/sandstone laminite is overlain by a siltstone which also has minor interbedded claystone and fine-grained sandstone. This unit generally lacks bioturbation and may have originated in a delta that developed as the marine influence regressed.

The Napperby Formation is unconformably overlain by Triassic alkaline–intermediate lavas of the Garrawilla Volcanics or sediments of the Purlawaugh Formation.

Basin Structure (Modified from Russell, 1981)

Introduction

The structure of the Gunnedah Basin was considered by early workers (Kenny, 1929; Hanlon, 1949a, b, 1950a, b) to be relatively simple, with a regional dip to the southwest, west and northwest. The recent drilling, however, has shown that the Permian and Triassic sediments above the basal volcanics have a trough-like structure, with a long axis trending north–northwesterly (Fig. 4–6). Dips are low, in the order of a few degrees, with steeper dips near the Mooki Thrust and adjacent to intrusives (Kenny, 1928, 1929, 1964; Hanlon, 1950b; Bean, 1974). The Jurassic sequence unconformably overlying the Gunnedah Basin varies from sub-horizontal to a very low, dominantly westerly dip (Kenny, 1964).

The shallow-dipping strata are also slightly deformed with a number of minor folds occurring (Hanlon, 1949a,b, 1950a; Kenny, 1964). Many of these folds were mapped by petroleum exploration companies during the late 1950's to early 1960's, largely by airphoto interpretation and supplemented by seismic and gravity surveys.

Structure of Basal Volcanics

Structure contours on top of the basal volcanics identify two prominent highs within the Gunnedah Basin (Fig. 4–6). These highs were referred to as the Boggabri Ridge by Brownlow (1981) and Russell (1981), and the Rocky Glen High by Russell (1981). The structure contours also indicate three prominent lows. One is centred to the southwest of Narrabri and corresponds in part to the Bohena Basin (Russell, 1981). A second is located southwest of Mullaley and may have been accentuated

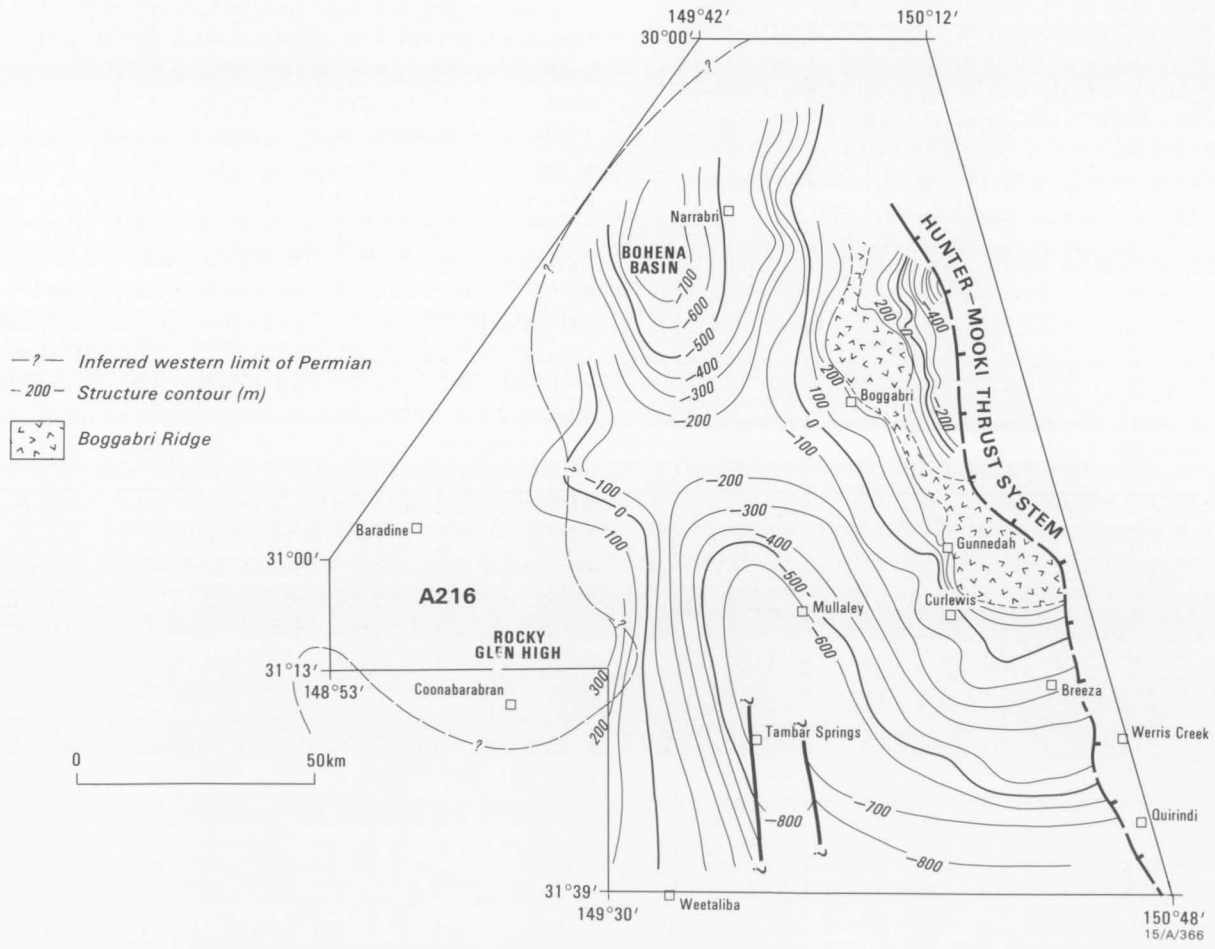

Fig. 4–6. Structure contours of top of basal volcanics. (See Fig. 4–1.)

by faulting, and an associated graben structure, which passes through the Premer area and is evident on seismic data (Agostini, 1981). A third low is present to the east of Boggabri. It deepens rapidly near the Hunter–Mooki Thrust and may have formed in response to movement on this thrust.

These three lows coincide with the thickest developments of the Early Permian Maules Creek Formation (Fig. 4–4) suggesting that they were pre-depositional topographic lows that were infilled by sediments of the Maules Creek Formation.

The Boggabri Ridge

A prominent high, the Boggabri Ridge, exists in the Baan Baa–Gunnedah area, where basal rocks of the Boggabri Volcanics and basic volcanics (probably equivalent to the Werrie Basalt) crop out along a south to southeast trend (Fig. 4–6).

Russell (1981) considered that the Boggabri Ridge was an original volcanic topographic high, which has subsequently undergone structural modifications. He further suggested that parts of this volcanic ridge remained above water until covered by the marine Porcupine Formation.

The eastern flank of the Boggabri Ridge is overlain by the Leard Formation and up to 1000 m of Maules Creek Formation, whereas the western flank is covered by a much thinner sequence (up to 125 m) of the Leard and Maules Creek Formations.

Russell (1981) suggested that this thickness variation in the Maules Creek Formation and equivalents might indicate two distinct depositional basins, separated by the volcanic Boggabri Ridge, during accumulation of the Maules Creek Formation. Results from the most recent drilling program, although generally supporting, do not conclusively substantiate Russell's contention. On the western side of the Ridge, the Maules Creek Formation was at least in part controlled by palaeotopographic features. However, isopachs of the Maules Creek Formation (Fig. 4–4) do not clearly demonstrate onlapping against the present-day ridge. (Such onlapping is necessary if the Boggabri Ridge is to represent an original topographic high, separating the region into two distinct basins.) Russell (1981) suggested that the sediments on the eastern flank of the Boggabri Ridge may have been emplaced by easterly dipping thrust faults, which have been inferred from ERTS-1 imagery (Scheibner, 1973).

The Rocky Glen High

The subsurface Rocky Glen High in the Coonabarabran area (Fig. 4–6) is composed primarily of acid volcanics. Russell (1981) considered that it was a prominent topographic high in Permian times, during which it was progressively onlapped by the Maules Creek, Porcupine and Black Jack Formations. Isopach information from the recent drilling program supports Russell's contention. Figure 4–4 (Maules Creek Formation) and Fig. 4–5 (Black Jack Formation) clearly demonstrate onlapping with the Rocky Glen High. This basement feature is also evident on aeromagnetic maps.

Other Structures

The Permian-Triassic sedimentary rocks dip westerly at angles of up to 5° throughout much of the basin. Structure contours on the base of the Black Jack Formation (Fig. 4–7) reflect, to some extent, those on the basal volcanics.

The northwestern region of the Gunnedah Basin has a thick sequence of early Permian to Triassic strata. These are overlapped by the Great Australian Basin Jurassic sequence. This area corresponds in part to the Bohena Basin (Fig. 4–6). A number of small folds have been mapped by seismic surveys. The largest of these folds is the Bohena Anticline (Fig. 4–8) which is 19 km long, north–south trending, and of low relief with a continuation farther south across a saddle. However, the structure contours on basal volcanics indicate that a major syncline is present beneath the anticline.

The southern portion of the Gunnedah Basin north of the Liverpool Range is largely covered by Jurassic strata. Permian and Triassic strata outcrop in the Gunnedah–Willow Tree area, and dip to the southwest. A number of minor folds have been mapped from Willow Tree northeast to Mullaley–Gunnedah (Fig. 4–8). These include the south to southwest-plunging New Windy, Caroona, Tribella, Watermark and Curlewis Anticlines and associated synclines, and the northwest-trending Milroy and Mirrabooka Anticlines and respective synclines. These folds were recognised from both surface mapping and airphoto interpretation. Close-spaced drilling in the Breeza and Caroona areas has verified the minor folding. Several of these structures have been drilled. The Mirrabooka Anticline may be related to Permian or Post-Permian magmatic intrusion, whereas the Caroona and New Windy Anticlines are probably not.

East of the Boggabri Ridge, the Maules Creek Formation dips gently to the northeast with steeper, more varied dips in proximity to the Hunter–Mooki Thrust. Some minor faulting is present.

Faulting within the Gunnedah Basin appears to be relatively minor, and is associated in many instances with Tertiary intrusions and associated warping or uplifting of the intruded sediments (Kenny, 1928, 1929, 1964; Hanlon, 1949a, 1950a, b).

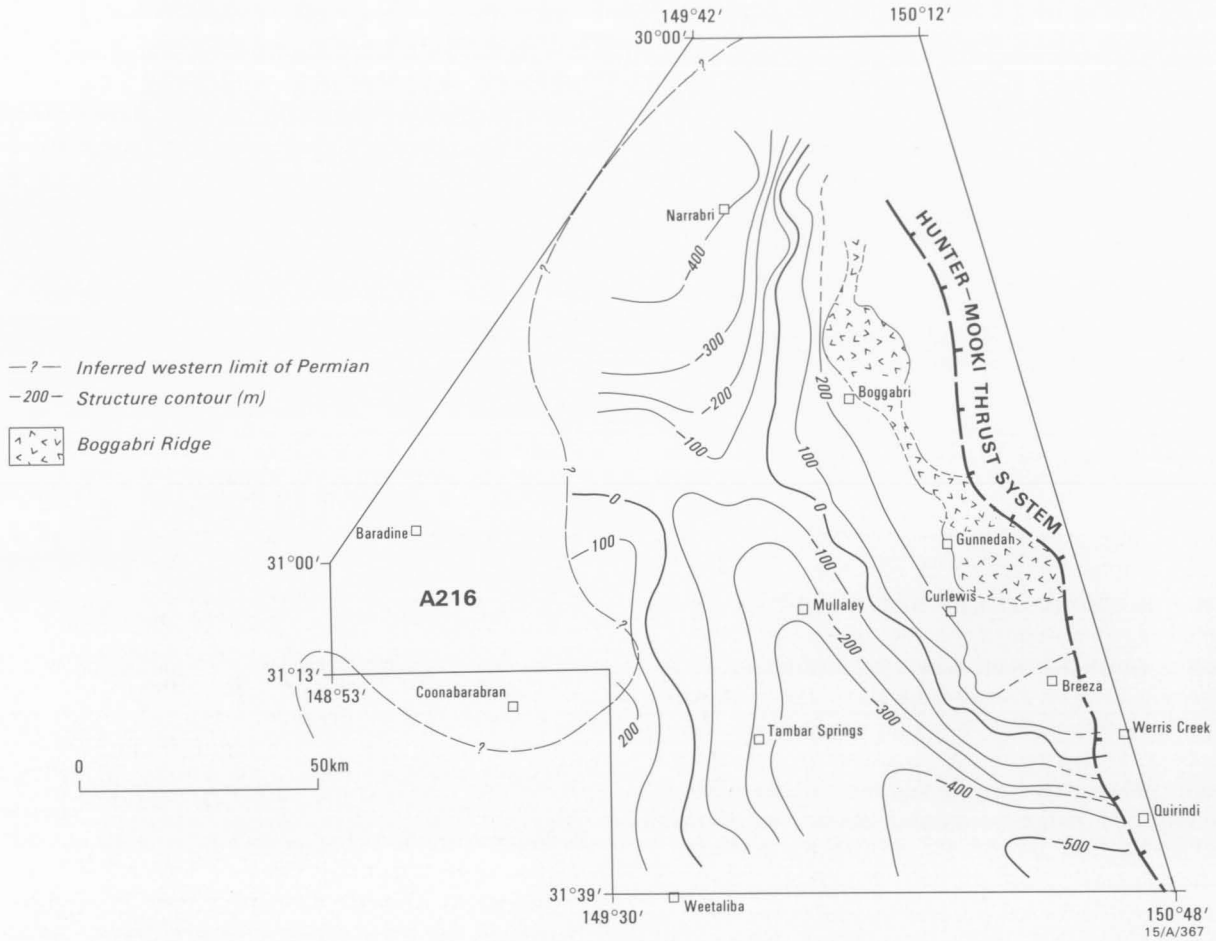

Fig. 4–7. Structure contours on base of Black Jack Formation. (See Fig. 4–1.)

Basin Correlation

A number of the depositional units identified in the Gunnedah Basin can be correlated with similar ones in the Western Coalfield and Hunter Valley (Fig. 4–9). In addition, the drilling results reaffirm and extend some of the correlations suggested by previous workers, dating back to Carne (1908, pp. 52–55), who equated the Hoskissons seam with the Lithgow seam of the Western Coalfield.

The Leard Formation is now known to extend over most of the region, from Boggabri in the north to near Quirindi in the south. This distribution indicates that the unit represents a widespread depositional event and supports Loughnan's (1975) contention that the Leard Formation is equivalent to the Skeletar Formation in the Hunter Valley to the south.

The coal measures of the Maules Creek Formation to the east of the Boggabri Ridge have long been recognized as being equivalent to the Early Permian Greta Coal Measures of the lower and upper Hunter Valley (Hanlon, 1949a; Branagan, 1969). West of the Boggabri Ridge, Early Permian coal measures were identified during oil exploration to the southwest of Narrabri (refer to Russell, 1981) and in small areas near Gunnedah (Hanlon, 1949a; McDonald, 1976) and Boggabri (Tadros, 1982). These Early Permian coal measures are now known to extend over most of the basin (Fig. 4–4). They span the palynological zones known as the Lower Stage 4 and Upper Stage 4a (McMinn, 1981b, 1982b, d) and are therefore equivalent to the Greta Coal Measures.

Hanlon (1949a, b) stated that the Porcupine Formation and overlying Watermark Formation (termed "Gladstone Formation" by Hanlon, 1949a) belong to the "Upper Marine Series". He thus implied a correlation with the marine Maitland Group of the Hunter Valley. Branagan (1969, p.451) and McClung (1980, p.63) correlated the Porcupine Formation with the Muree Sandstone, a formation within the Maitland Group.

The lithological sequence encountered during recent drilling suggests that the Watermark Formation is broadly equivalent to the Mulbring

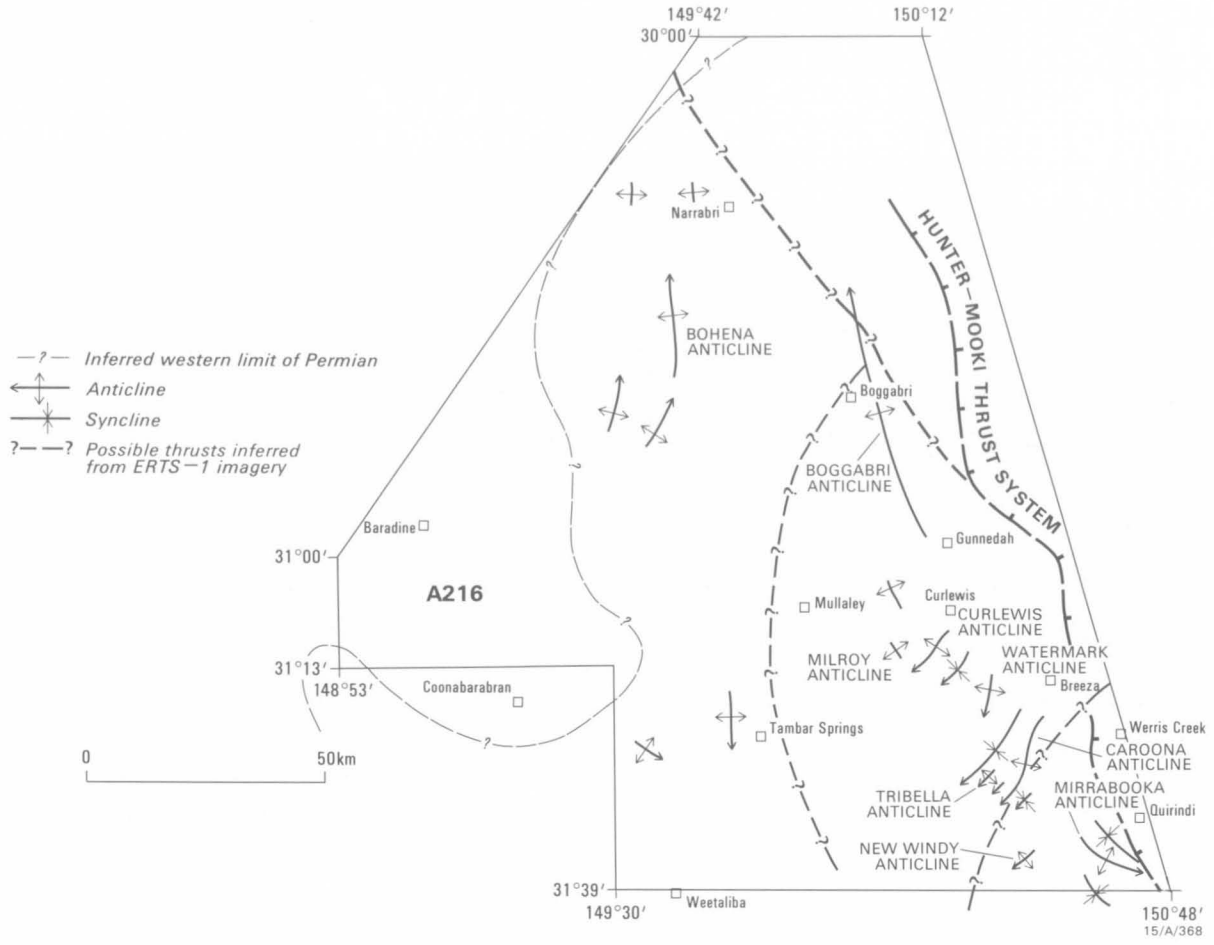

Fig. 4–8. Structure of the Gunnedah Basin (modified after Russell, 1981). (See Fig. 4–1.)

Siltstone (the top formation of the Maitland Group) and that the Porcupine Formation is equivalent to the two lower formations — the Muree Sandstone and Branxton Formation (see Fig.4–9) which also shows similar correlations with the Western Coalfield (based on discussions with G. Bradley).

It thus appears that Early Permian coal measures throughout the Sydney (depositional) Basin were inundated by the same marine incursion. Palynological evidence suggests that this marine transgression took place in Late Permian times equivalent to Upper Stage 4; it further indicates that the subsequent regression of marine conditions occurred sooner in the Gunnedah Basin than in the Hunter Valley and the Western Coalfield (McMinn, 1981a, 1982a). This time difference probably reflects the encroaching Late Permian delta system which prograded from the north of the Sydney Basin in the Gunnedah–Narrabri region.

The Arkarula Sandstone Member was deposited during an apparently basin-wide, short-lived marine transgression and regression in early Late Permian times. It is equivalent to the Archerfield Sandstone of the Hunter Valley. The overlying Hoskissons Coal Member can be correlated with the Bayswater Coal Member of the Hunter Valley. (The Bayswater Coal Member overlies the Archerfield Sandstone.) Both seams are thick, continuous, and have mostly dull coal.

A thin sequence of bioturbated siltstone and sandstone is present with the upper delta plain facies of the Black Jack Formation. This interval is possibly equivalent to the Denman Formation of the Hunter Valley (and thus the Baal Bone Formation of the Western Coalfield). Palynological evidence suggest that these units are all of similar age (McMinn, 1982a; and pers. comm.).

The Goran Conglomerate Member, which heralded the beginning of terrestrial sedimentation, may be equivalent to the Gap Sandstone (P. West pers. comm.). It is near the base of a sequence characterized by dull stony coal, tuff and tuffaceous claystone, and may be equivalent to the lithologically similar Wollombi Coal Measures in the Hunter Valley, and the Farmers Creek Formation in the Western Coalfield.

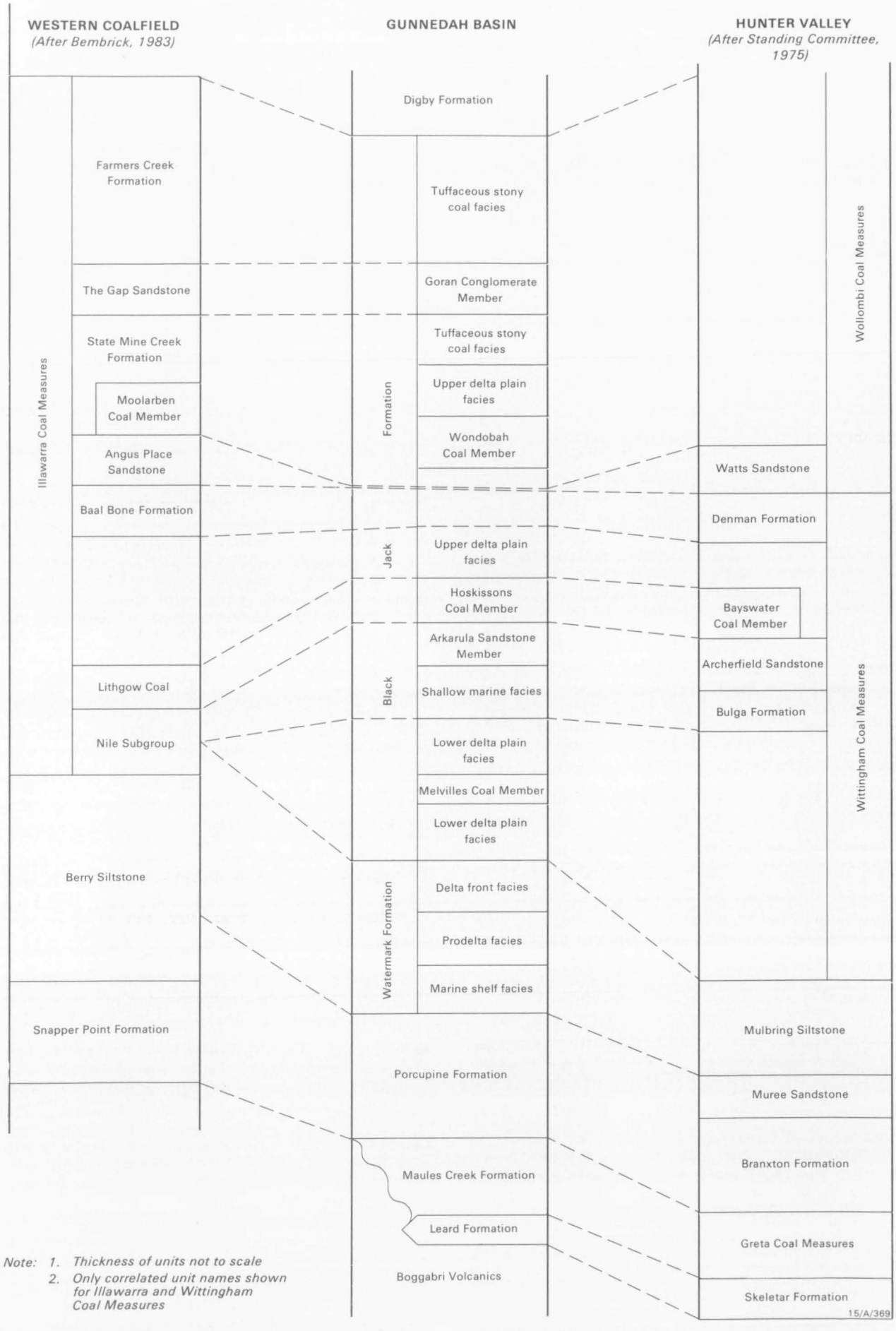

Fig. 4–9. Schematic correlation diagram.

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CHAPTER 5

Permian Coal Measures in the Gloucester Basin and Myall Syncline

by
A.T. Brakel

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Introduction

The Gloucester Basin, also referred to as the Stroud–Gloucester Syncline or Trough, lies 80 km north of Newcastle on the extension of the northerly trend of the Medowie Syncline (Fig. 5–1). It is about 38 km long by 10 km wide. The basal Permian volcanic sequence (the Stroud Volcanics) appears to have been continuous with the Dalwood Group of the Sydney Basin, but the overlying 2100 m-thick coal measures form an isolated sequence which began deposition at the time of the Branxton Formation in the Hunter valley. The mainly freshwater sequence has an erosional top at the present-day ground surface, and is separated by only 14 km from the marine Permian of the Manning Group to the north. An outlier, the Wards River Basin, occurs east of the main basin near Craven, and is equivalent to the basal Stroud Volcanics.

About 25 km southeast of the Gloucester Basin, thin Permian freshwater sediments with some impure coal are present in the northwesterly trending Myall Syncline.

Stratigraphy

Stratigraphic Nomenclature

The name Gloucester Coal Measures was originally applied by Sussmilch (1921) to the entire sequence above the volcanics. The measures were first subdivided into six formations and named by Loughnan (1954), as in Fig. 5–2. George (1975) published a different nomenclatural scheme. Occasionally, the name "Stratford Coal Measures" has been applied to the whole sequence above the Wards River Conglomerate (after Bewley's, 1971, unpublished unit of that name), and it has been used by Robinson & Shiels (1975), Brakel (1984), and in statistical tables by the Joint Coal Board of New South Wales (1979).

A completely revised stratigraphy of the Permian sequence in the Gloucester Basin has been published by Lennox & Wilcock (1985), based on extensive new work (Fig. 5–2). In the new scheme, the old Dewrang Formation has been taken out of the Gloucester Coal Measures and its status raised to Dewrang Group, consisting of three newly named formations. The former Avon Coal Measures has been divided into the Avon Subgroup (two formations), Speldon Formation, Wenham Formation, and Bowens Road Coal. The Wenham Formation and Bowens Road Coal are the first two units of the Craven Subgroup, which takes up the rest of the Gloucester Coal Measures. The Wards River and Crowthers Road Conglomerates are retained as formations within the subgroup, but the old Craven Coal Measures, Spring Creek Conglomerate, and Broad Gully Formation are amalgamated as the new Jilleon and Leloma Formations.

A correlation of the sequence with that in the Hunter Valley, based largely on McMinn (1987), is shown in the last column of Fig. 5–2. The Dewrang Group and the Gloucester Coal Measures are time equivalent to the Branxton–Mulbring interval and the Wittingham Coal Measures, respectively. The Speldon Formation is a marginal marine deposit, equivalent to the Kulnura Marine Tongue and Archerfield Sandstone of the Sydney Basin. The Bowens Road Coal member is the local equivalent of the Bayswater Coal Member.

The volcanics directly underlying the coal measures were referred to as Gloucester Rhyolites by Sussmilch (1921) in the same publication in which he named the Gloucester Coal Measures; the latter have page priority. The volcanics have also been called Stroud Volcanics (Campbell, 1961), and Engel (1966) correlated them with the Alum Mountain Volcanics of the nearby Myall Syncline. All three names are in common use. To avoid conflict with the Gloucester Coal Measures, the name "Gloucester Rhyolites" should be abandoned. The oldest published name is then the Stroud Volcanics, and this is recommended as the best name to use in the Gloucester Basin. The base of the volcanics has a Stage 3a palynological age (Helby & others, 1986: McMinn, 1987), making the unit equivalent to the Gyarran Volcanics of the Upper Hunter region.

Dewrang Group

The Dewrang Group overlies the Stroud Volcanics and extends around the margins of the Gloucester Basin, except for part of the faulted northern end. Loughnan (1954) recorded a thickness of about 340 m, Lindsay (1974) about 450 m. Its lowermost unit, the Durallie Road Formation, consists mainly of about 180 m of lithic sandstone, but with significant thicknesses of conglomerate, siltstone and shale, and minor coal. At the base of the overlying Weismantels Formation is the 11 m-thick Thirty Foot seam (Loughnan, 1954) and associated mudstones. The remainder of the group comprises medium to coarse-grained feldspathic sandstone.

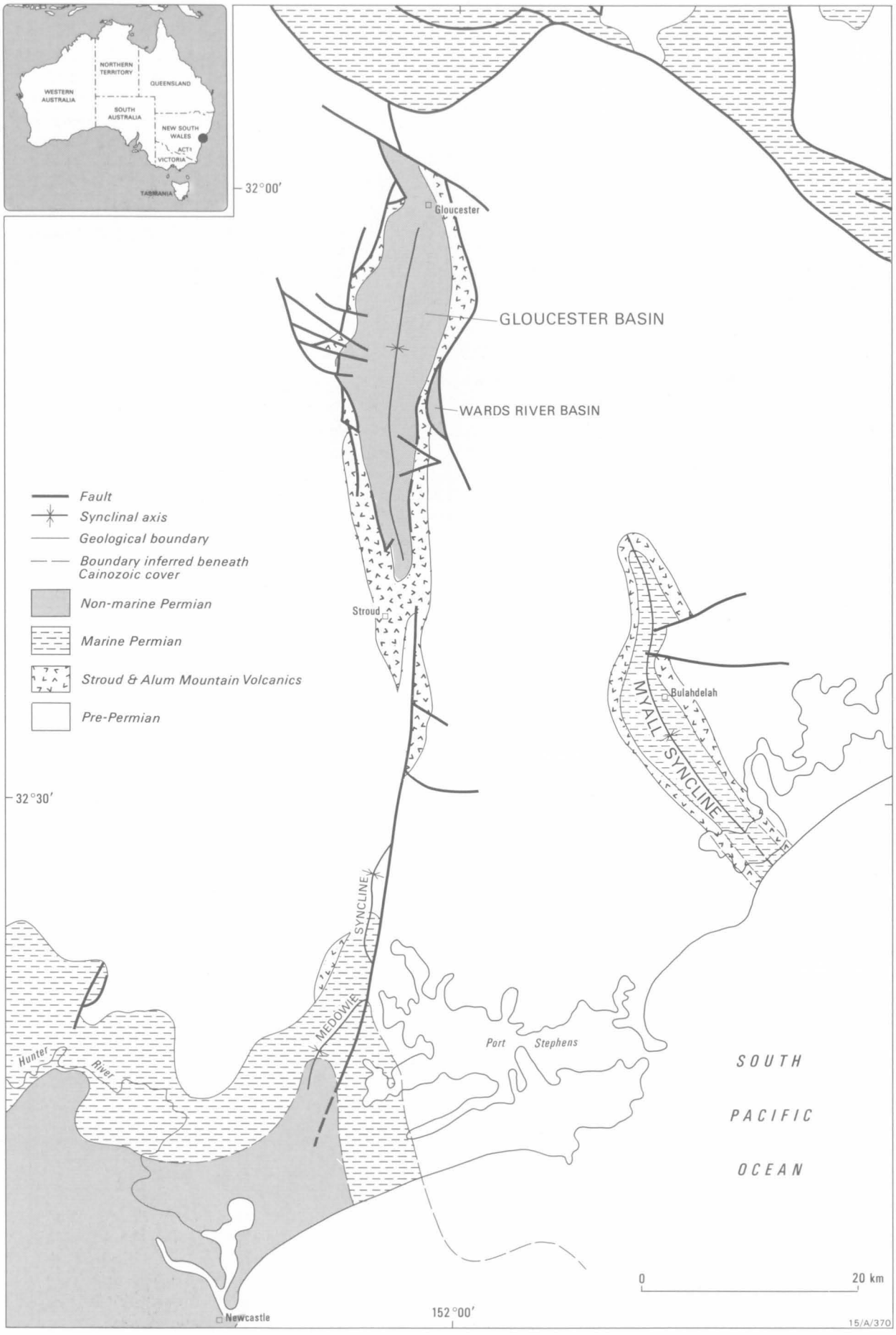

Fig. 5–1. Location of the Gloucester Basin and Myall Syncline.

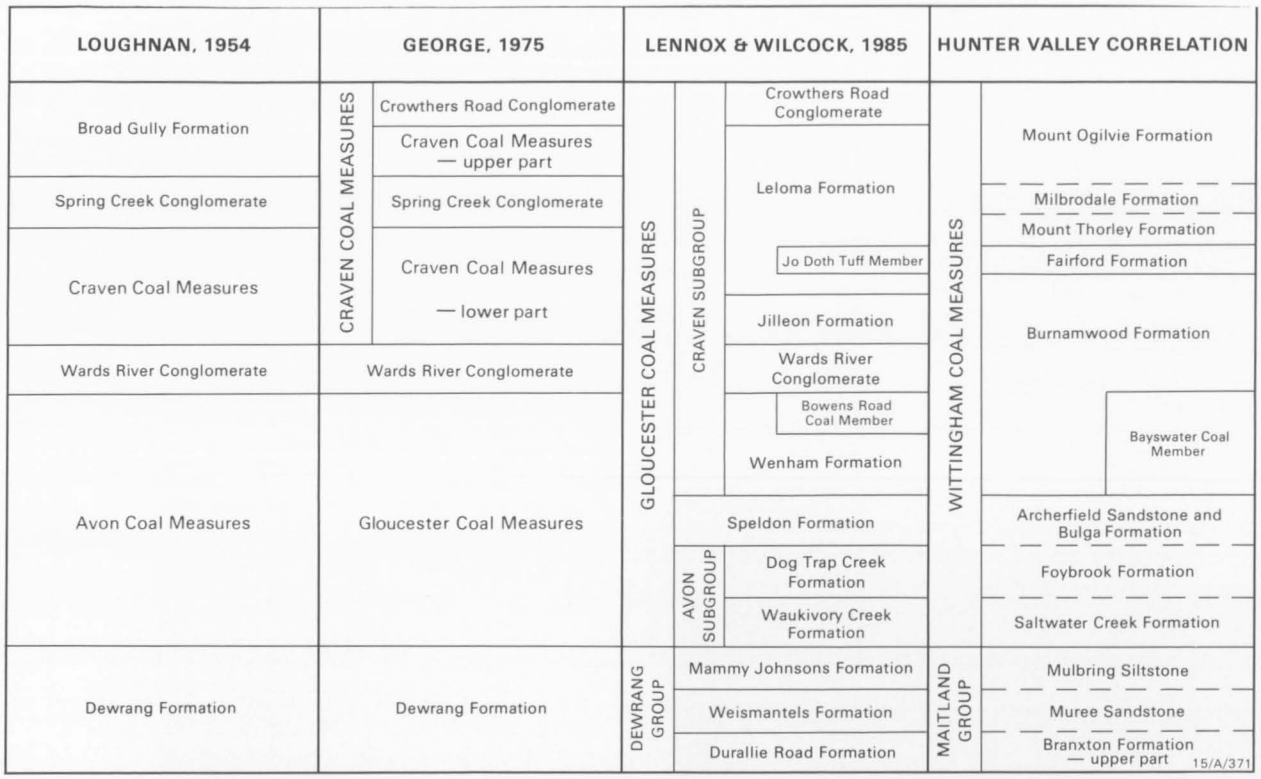

Fig. 5–2. Development of stratigraphic nomenclature of the Gloucester Coal Measures. The comparison of the Lennox & Wilcock (1985) nomenclature with previous schemes is after Helby & others (1986). The correlation with the upper Hunter Valley sequence is largely after McMinn (1987); the new Milbrodale, Mt. Thorley, and Fairfold Formations have been inserted following Hall & Wootton (1985), and the correlation of the to Doth Tuff Member with the Fairfold Formation is after Lennox & Wilcock (1985).

Gloucester Coal Measures

The Gloucester Coal Measures, as now defined, is divided into two subgroups and the intervening Speldon Formation. The first of these, the Avon Subgroup, consists of lithic sandstone with some siltstone, shale, and coal. Its uppermost coal seam is overlain by a sandy unit with conglomerate lenses, the Speldon Formation.

The succeeding Craven Subgroup begins with sandstones of the Wenham Formation forming the substrate of the Bowens Road seam. Accumulation of the coal was terminated by the wedge-shaped deposit of the Wards River Conglomerate, the thickness of which ranges from 1130 m on the western basin limb (Bewley, 1971) to 67 m (Loughnan, 1954) or less elsewhere. This prominent unit of massive conglomerate forms extensive outcrops which can be traced continuously around the basin. The pebbles, cobbles, and boulders in the rock are derived from the older volcanics in the region, but a few are blocks of fossil wood. Interbeds of sandstone, and minor layers of shale and coal also occur. The Jilleon and Leloma Formations have volcanilithic and quartz–feldspar–lithic sandstones, volcanilithic conglomerate, siltstone, carbonaceous shale, and numerous coal seams ranging up to 2.7 m thick. Claystones representing re-worked, diagenetically altered, air-fall, vitric tuffs provide prominent marker horizons; the thickest, the Jo Doth Tuff, is correlated with the Fairford Formation of the upper Hunter Valley (Lennox & Wilcock, 1985). The Crowthers Road Conglomerate occupies the highest part of the sequence now preserved, and occurs only in the centre of the basin. It is predominantly conglomerate similar to those lower in the sequence. Rare clasts have been found of tuffite with pre-Permian brachiopods. Hancock (1974) recorded that the unit is 80% conglomerate near its base, but it fines to 20–25% conglomerate near its top.

Wards River Basin

About 2 km east of Craven, an outlier of coal-bearing sediments occurs in a small structural basin separated from the main basin by steeply dipping volcanics. Osborne (1950) described it as a block-faulted basin, about 11 km long by 0.8 km wide, with a thick sequence of mudstone, carbonaceous shale, coal, sandstone and some conglomerate. It

has now been correlated by palynology with the basal Stroud Volcanics, the Markwell Coal Measures of the Myall syncline, and the lower Skeletar Formation of the Greta Coal Measures (McMinn, 1987).

Markwell Coal Measures

Within the Myall Syncline and overlying the Alum Mountain Volcanics are the Markwell Coal Measures, which consist of up to 12 m of conglomerate, pebbly sandstone, shale and inferior coal (Engel, 1962). The formation occurs as lenses along the eastern and western limbs of the structure, up to 14 km north, 8 km south and 4 km west of Bulahdelah. The conglomerate is the only persistent lithology and marks the base of the outcrop around the syncline. The coal measures are overlain by the marine Permian Bulahdelah Formation, of uncertain precise age.

Engel (1962) also noted a thin coal measures sequence of conglomerate, arenite, shale, and up to 6 m of banded coal, apparently conformable within the Alum Mountain Volcanics in the eastern limb of the syncline 5 km southeast of Bulahdelah, but he tentatively mapped it as a downfaulted trough of Markwell Coal Measures, following Osborne (1950). Carey (1934) described it as a conformable development. It is probably analogous to the similar coal-bearing lenses within the Stroud Volcanics, and within the Lizzie Creek Volcanics of the Bowen Basin.

Age and Correlation

The Markwell Coal Measures are of Stage 3a palynological age (McMinn, 1987), and are thus equivalent to the lower Skeletar Formation of the Greta Coal Measures, and the coal-bearing lenses near the base of the Stroud Volcanics. A Greta age was first suggested by Osborne (1950), and is implied by the fauna in the overlying Bulahdelah Formation. This fauna is undescribed, but the fossil list given by Pittman (1901) includes none of the species diagnostic of Fauna IV, thus strongly suggesting that the Bulahdelah Formation is no younger than Fauna III, i.e., it is equivalent to the Branxton Formation, or possibly slightly older (J.M. Dickins, pers. comm.).

Any coal interbedded with the Alum Mountain volcanics would be comparable in age to the Reids Dome Beds and Lizzie Creek Volcanics of the Bowen Basin, and perhaps to the oldest lenses of the Clyde Coal Measures of the southern Sydney Basin. Engel (1962) pointed out that if this coal is conformable within the volcanics, then the *Glossopteris*-bearing coal measures would underlie a *Rhacopteris*-bearing arenite; this would be unusual, but palaeontologically possible. The implication would be that these coally beds occur close to the base of the Permian.

The Dewrang Group has an Upper Stage 4b to Lower Stage 5b age, equivalent to the upper Branxton–Mulbring interval, whereas the Gloucester Coal Measures range from Lower Stage 5c to Upper Stage 5, and are therefore equivalent to the Wittingham Coal Measures (McMinn, 1987). Thus, coal measures deposition in the basin began while the marine Maitland Group was being deposited in the Sydney Basin to the south. This has implications for the deposition of coal north of the present Hunter Thrust, especially in the light of the known increase in thickness of Greta Coal Measures towards the thrust (Plate 8) and in the Cranky Corner Basin (Slee, 1968), and the deposition of coal during Maitland Group time north of Muswellbrook (Morris, 1982). If the northerly diminution in marine sedimentation is a regional trend, as seems likely, and coal was being deposited in this region during much of Greta to Newcastle time, a thick coal measures sequence could have accumulated. Some of these deposits could now be preserved below the Hunter Thrust, where they may be a potential source of natural gas, and of coal suitable for future underground gasification.

Examination by J. Hunt of recent drilling samples has found that the top half of the Bowens Road seam is petrographically similar to the Bayswater Coal of the Wittingham Coal Measures, and that the coal is underlain by a burrowed interval correlated with the Archerfield–Bulga (i.e., Kulnura) marine incursion (see Chapter 17). This confirms that the Avon Subgroup is equivalent to the lower part of the Tomago Coal Measures.

Structure

The Gloucester Basin is a meridional, open, canoe-shaped fold, much disrupted by faulting. It is the northern part of a much longer structure, which extends from the open Medowie Syncline in the Sydney Basin north of Newcastle, through an axially tightened region south of Stroud, to open out again northwards to Gloucester. The meridional orientation is similar to the trend of structures formed in the Sydney Basin towards the end of Maitland Group time (see Chapter 28). The basin is truncated by faulting at its northern end, affected by strike-oriented faulting along its southern limbs, and cut by transverse faults, such as the Upper Avon fault, on both sides of the basin.

Osborne (1950) interpreted a compressive stress from the northeast after the main meridional structure had been formed. Lennox & Wilcock (1985) attributed the structural features of the basin, except for the meridionally trending normal faults, to the action of NW–SE trending shear movements

which were active at least until the end of Wenham Formation time; post-Permian tectonism was similar in style and culminated in synclinal folding of the basin and pervasive low-angle thrusting. There was minor normal faulting in the Tertiary.

Bedding dips on the flanks are 60–70°, but diminish towards the fold axis. Strata in the Dewrang Group average 45–50° around the southern end of the basin. On the eastern flank, the Avon subgroup dips at about 40°, but locally flattens along at least 1.8 km of strike length (King, 1979). Numerous small-scale thrusts and folds occur within the basin (Osborne & Andrews, 1948; Osborne, 1950), causing great difficulties for mining in many areas.

The Wards River Basin is a tectonic structure, either unconformable on, or overthrust onto, older rocks, with its beds dipping easterly at 50° (Loughnan, 1954). Its strata may be overturned (McMinn, 1987).

Igneous intrusions are uncommon. Two 0.6 m-wide dykes are known (George, 1975), but these do not materially affect the coal.

The Myall Syncline is an open elongate fold with a northwesterly trend except for a bend to the north near its middle. The eastern limb north of Bulahdelah is transected by two faults which may bound an uplifted block. The flanks dip at 20–35°, but there are local dips up to 65°.

Environment and Palaeogeography

Gloucester Basin

Sedimentological studies of the basin have been carried out by Hancock (1974), Lindsay (1974), and Lennox & Wilcock (1985). The first two workers obtained their results from outcrops, whereas the latest study was based on extensive drilling, and is the most detailed. The following summary of the sedimentation is derived from Lennox & Wilcock (1985), except where otherwise noted.

The palaeogeography of the Gloucester Basin was that of a narrow, north–south-trending trough. Throughout the stratigraphic column, the palaeocurrents were usually directed towards the south; conglomerates, for example, are coarser in the north than in the south (Hancock, 1974). Lindsay (1974) noted that the Permian conglomerates are more poorly sorted and less mature than the Carboniferous conglomerates, indicating a short distance of transport. The south-flowing axial drainage received contributions of sediment from both sides of the basin, with the western side normally dominating (Hancock, 1974; Lennox & Wilcock, 1985).

Deposition in the basin was instigated and controlled by meridional faults active during sedimentary infilling, beginning in Stroud Volcanics time, when fluvial gravels, sands, and associated peats came to lie at the base of the unit and interbedded with the volcanogenic rocks.

The Dewrang Group probably originated as a near-shore marine, barrier and freshwater lagoon complex of a wave-dominated fan delta system. A regressive phase, correlated with the Muree Sandstone, is marked by a thick back-barrier coal and lagoonal mudstone of the Weismantels Formation.

Relative uplift of the surrounding highlands led to a change in sedimentary dynamics at the start of the Gloucester Coal Measures. During Avon subgroup time, one basin-controlling meridional fault had a throw of about 400 m. The Avon sediments were deposited as fluvial valley fill (Hancock, 1974), with braided alluvium passing distally into the meandering stream–floodplain regime of an upper delta plain (Waukivory Creek Formation). A basin-wide peatland encroached across the area as the supply of clastics waned, resulting in a thick coal, until conditions were changed by a rising sea level. First, a lower delta plain environment (Dog Trap Creek Formation) appears to have spread from the northeast, which may have been open to the sea at this time. Transgression of beach and marine sands of the Speldon Formation, preceded by a back-beach coal-forming marsh, then took place in the northeastern sector of the basin. The Speldon is also believed to contain deltaic and marginal marine deposits, formed when distal braided alluvium debouched directly into the sea, and is topped by a prograding deltaic coal. A thin veneer of Wenham Formation lower delta splay sands was laid down, before another major peatland, subject to subaerial oxidation like its Bayswater correlate, developed across the site. The accumulation of the resulting Bowens Road seam was terminated all over the basin by the advancing alluvial fan of the Wards River conglomerate, after the reactivation of marginal faults.

The subsequent Jilleon and Leloma Formations comprise meandering stream and braided sheet outwash sedimentation (Hancock, 1974), with some occurrences of cannel coal above the Wards River Conglomerate recording the existence of open-water swamps (the "open moor" of Hacquebard & Donaldson, 1969). Point bar cycles of the meandering stream floodplain formed downslope from the braided alluvium, and in the more distal reaches lakes, muddy marshes, and peat swamps were present. Sand-dominated channels, 5–15 m thick and 1–3 km wide, were frequently stacked against

east–west trending normal faults. The Crowthers Road Conglomerate at the top of the sequence is another braided outwash fan (Hancock, 1974).

Myall Syncline

No sedimentological work has been done on the Markwell Coal Measures of the Myall Syncline, but the preponderance of conglomerate suggests a braided sheet outwash environment. Peat was deposited in marshy interchannel areas which frequently received overbank clastics, resulting in inferior coal. Much of the terrestrial sediment was was probably eroded away before or during the marine transgression which led to the deposition of the overlying Bulahdelah Formation.

Coal Deposits

Early attempts were made to mine coal on a small scale at Gloucester and Dewrang, but the steep dips of the seams at these localities, the numerous minor folds and faults, and the high water table make mining hazardous and uneconomic (Loughnan, 1954). Exploration by companies in recent years has delineated economic coking and thermal coal deposits in a more geologically favourable region between Stratford and Wards River; the reserves can be mined by open cut methods at a proposed rate of 1.8 million tonnes/year.

The coal occurrences in the Myall Syncline are too small and of too poor quality to be exploitable, and there appears to be no prospect of finding an economic deposit.

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CHAPTER 6

Ashford Coal Field

by
P.E. O'Brien

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Introduction

Permian coal-bearing sediments crop out in a north-northeasterly trending belt 0.5 km wide and 56 km long, near the town of Ashford, New England (Plate 2). These sediments were described by Hanlon (1974), Owen & others (1954) and Britten (1975).

Stratigraphy

The stratigraphy of the Ashford coal field is shown in Fig. 6–1. The Beacon Mudstone consists of deformed mudstone with minor chert, tuff and quartzite, probably of Early Carboniferous age. It is intruded by the Ashford Granite, a fine-grained biotite granite of Permian age. The Ashford Coal Measures overlie the Beacon Mudstone with angular unconformity on the eastern side of the outcrop belt and are faulted against it on the western side. The coal measures comprise interbedded conglomerates, sandstones and mudstones with thin coal seams through most of the section (Fig. 6–1). Only two, the Ashford and Bonshaw seams, reach appreciable thickness. The Ashford Coal Measures are intruded and overlain by Tertiary basic volcanics in a few places (Owen & others, 1954) and overlain by alluvium.

The Ashford Coal Measures are though to be of Early Permian age, similar to the Greta Coal Measures or even older, on the basis of macrofloral evidence (Britten, 1975).

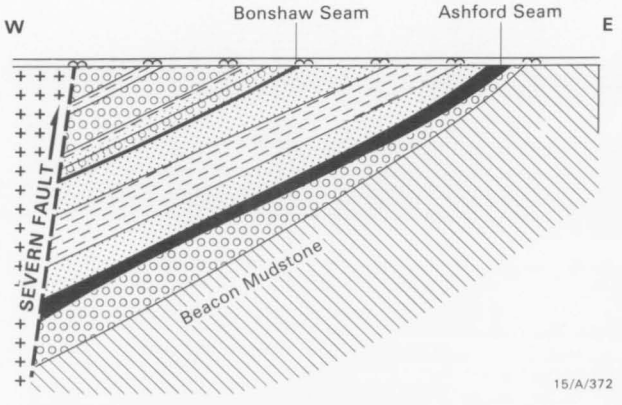

Fig. 6–1. Cross-section of the Ashford Coal field from Owen & others (1954).

Structure

The Ashford Coal Measures are preserved on the downthrown side of a major reverse fault, the Severn Thrust. Bedding in the coal measures dips between 20° and 40° towards the west, into the thrust (Fig. 6–1). Some minor faults cut eastwest across the outcrop area and the rocks are strongly jointed.

Coal Seams

Of the two major coal seams, only the Ashford seam has been considered of economic importance. It varies from 2 to 16 m thick. Black, carbonaceous shale is common in the coal, adversely affecting quality. Inferred resources are 6 Mt in situ (Britten, 1975).

Origin of the Ashford Coal Measures

The Ashford Coal Measures are remnants of more extensive Permian deposits on the New England Block during Early Permian times and preserved by faulting. The original extent of these Permian rocks is unknown, and so is the timing of movement on the Severn Thrust.

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CHAPTER 7

Permian Coal Measures in the Exposed Part of the Bowen Basin

by
A.T. Brakel

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Introduction

The Bowen Basin, though not as large a total producer of coal as the Sydney Basin, is nevertheless the largest producer for export of black coal in the world. The inferred coal resources are rated as "very large", while in situ measured and indicated reserves stand at 23 678 Mt, of which 57% are deemed recoverable (Joint Coal Board, 1984). Open-cut extraction predominates over underground mining, and both good quality coking and thermal coal are produced. Coal rank varies progressively from high-volatile bituminous to semi-anthracite.

The basin lies at the northern end of the Sydney–Bowen meridional trough, and the outcrop forms an elongate 75 000 km^2 triangular area inland from the central Queensland coast (Figs 7–1 and 7–2). The basin boundaries are erosional ones, at the present limits of Permian rocks, except east of Duraringa, where the boundary from the Connors Arch to the Auburn High lies obliquely across the Gogango Folded Zone, and on the Springsure Shelf, where it follows the extension of the Nebine Ridge. In the subsurface south of the Springsure Shelf outcrop, the Triassic sediments overlap the Permian in places. The Permo-Triassic succession dips unconformably beneath the Jurassic of the Surat Basin south of about 25° latitude. This chapter deals with the Bowen Basin rocks as far as 26° south, beyond which they are dealt with in Chapter 8.

Around Clermont, a number of small basins occupy low areas in the basement rocks (Fig. 7–2; see also Price, 1983, fig. 18). Of these, the Blair Athol, Wolfang and Karin Basins contain coal measures. The Calen Basin, near Mackay, is the subject of Chapter 9.

Unlike the Sydney Basin, the Bowen Basin has not been formally subdivided into coalfields. For

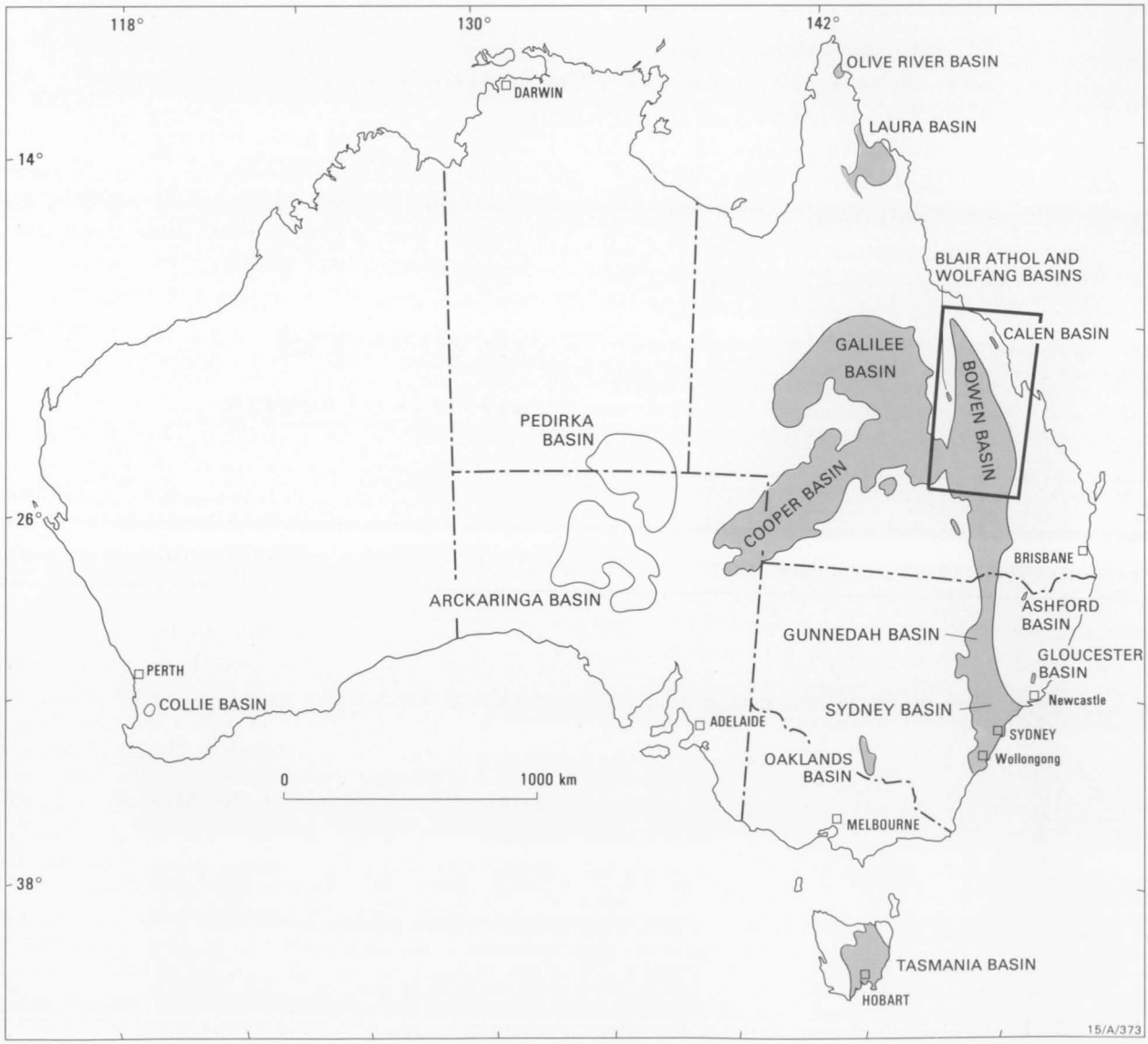

Fig. 7–1. Location of the exposed area of the Bowen Basin and adjacent sub-Surat portion to 26°S.

the purposes of this report, North, Central, Southwest, and Southeast subdivisions are used (Fig. 7–3), which are designated in the data-base (microfiche 1) as Bowen, North; Bowen, Central; Bowen, Southwest; and Bowen, Southeast, respectively. The minor basins are listed as Bowen, North : Blair Athol; Bowen, North : Wolfang; and Bowen, North : Karin.

The presence of coal in the basin has been known since 1845. King (1975) gives a history of geological investigations. The first commercial mine was opened at Blair Athol, in 1892, followed in the Bowen Basin proper by workings at Bluff, in 1904. Thousands of bores have been drilled, including petroleum and coal exploration, reserve assessment, and stratigraphic bores. Almost all drilling for petroleum has been done in the southern half of the basin, south of 23° latitude, with the greatest concentration in the Denison Trough, where small gas fields have been discovered. The sparsest drilling coverage is along the eastern side, along the western margin near Capella, and in the central part of the Mimosa Syncline.

Fig. 7–3. Bowen Basin district subdivisions, as used in this report.

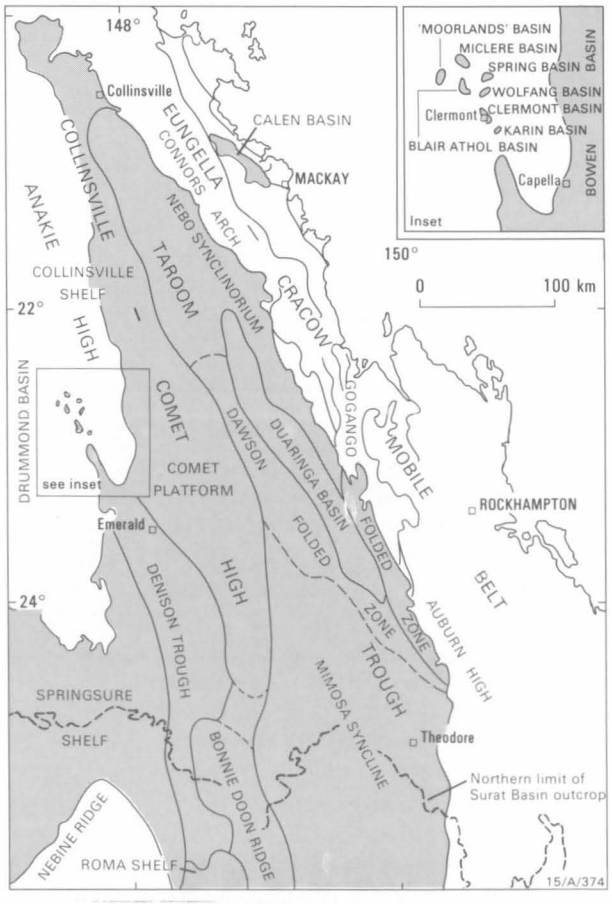

Fig. 7–2. Structural sub-divisions of the Bowen Basin north of 26° latitude as used in this report.

Structural Subdivisons

Dickins & Malone (1973) subdivided the basin into its tectonic elements, the general aspects of which are still valid and which form the basis of the subdivisions in Fig. 7–2. Broadly, the basin has four major tectonic elements: the Taroom Trough, the Collinsville–Comet High, the Denison Trough, and the Springsure Shelf, and these consist in turn of lesser subdivisions.

The Taroom Trough occupies the eastern half of the basin, and is bisected by the northwesterly trending Dawson Folded Zone into the Nebo Synclinorium (north) and the Mimosa Syncline (south). Along the central eastern basin margin, the Gogango Folded Zone splits off from the Dawson Folded Zone and trends northerly into the Grantleigh Trough towards Broad Sound. The elongate Tertiary Duaringa Basin lies adjacent to the eastern side of the Dawson Folded Zone and parallel to the eastern Bowen Basin margin, and is a graben in which 1219 m of Tertiary sediments, including oil shales, have been intersected (Noon, 1982).

Along the northwestern basin margin, and extending southward along the western side of the Mimosa Syncline, is a basement high here termed the Collinsville–Comet High. At the basin margin it is a shelf, called the Collinsville Shelf, but southwards it becomes a ridge, in contrast to the lows on either side. The northern end of the ridge is the Comet Platform (or Ridge), which is separated by a saddle from the southern end, here referred to as the Bonnie Doon Ridge.

Adjacent on the west to the southern half of the basement high is the Denison Trough. In the south it is a graben, but northwards it comprises a series of half grabens. On trend with the northern extension of the trough there are at least seven minor basins of Permian rocks within basement lows, including the Blair Athol, Wolfang, and Karin Basins. At the southern end of the Denison Trough lies the Roma Shelf.

The Springsure Shelf connects the Bowen and Galilee Basins. A north-trending anticline is the expression in the cover rocks of the underlying basement Nebine Ridge, and separates the Bowen Basin eastern part of the shelf from the Galilee Basin western portion.

Between the Bowen and Galilee Basins is the Anakie High, comprising Devonian and Carboniferous rocks, including the Carboniferous Drummond Basin. On its eastern flank, the Bowen Basin is bordered by the Eungella–Cracow Mobile Belt, a zone which has undergone volcanic, intrusive, and tectonic activity from Carboniferous to Mesozoic times. The numerous tuffs in the Permian sequence were erupted from volcanoes in this belt. It is divided by the Gogango Folded Zone into the northern Connors Arch and the southern Auburn High. East of the mobile belt, the Early Permian Grantleigh Trough extends parallel to the coast, and includes the Calen Basin unconformably within it.

Stratigraphy

For the newcomer to the Bowen Basin literature, coming to grips with the stratigraphic nomenclature is a daunting task. Not only are there different stratigraphic sequences in different regions of the basin, but there are many obsolete units, even whole obsolete stratigraphic schemes, as well as redefined units (such as the Bandanna Formation, which was originally about twice as thick as it is now because it included the later-defined Black Alley Shale). Other coal measure units have also had their boundaries redefined from time to time, though not as drastically, so that a reader needs to be especially alert to the date of a publication. It has been known for authors to amend boundaries between units without specifically stating that changes have been made. Apart from these difficulties, there are large gaps between outcrop areas, and differences of opinion exist concerning the correlation of the respective sequences.

The stratigraphy of the Bowen Basin has been reviewed in many publications, including Dickins & Malone (1973), Hawthorne (1975), Milligan (1975a), and Jensen & others (1976). Staines & Koppe (1980) reviewed the geology of the northern Bowen Basin. Jensen (1975) dealt with the upper Permian (Blackwater Group) and Triassic sections. Wells (1981) has given a succinct summary of the coal measure units. There have also been numerous publications, especially from the Geological Survey of Queensland and the Bureau of Mineral Resources, dealing with particular areas and/or parts of the stratigraphic column, and with the palaeontologic biozonation as it applies to stratigraphic correlation. These references are included in the selected bibliography at the end of this chapter.

The stratigraphic names presently in use are shown in Figs 7–4 and 7–5. The basin succession in the east began with the accumulation of a thick pile of bimodal volcanics (Lizzie Creek Volcanics and Camboon Andesite), which extend in the subsurface as far west as the AFO Comet 1 and MPA Glenhaughton 1 wells. The Lizzie Creek Volcanics have some intercalated marine sediments and, near Collinsville, some lenticular uneconomic coal measures, named the Devlin (or Crush Creek) Coal Measures (Malone & others, 1966). In the northwest of the basin, at that time, there was no deposition, while in the southwest the thick sequence of coal-bearing Reids Dome beds accumulated in the Denison Trough. An almost basin-wide marine transgression ushered in a new episode of sedimentation, the Back Creek Group. Palaeontologically, this episode spans Dickins' (1964) Fauna II (Tiverton Subgroup), Fauna III (Gebbie Subgroup), and Fauna IV (Blenheim Subgroup). Marine conditions were temporarily interrupted in the north by the progradation of the fan–delta wedge of Collinsville Coal Measures, and in the Denison Trough by the fluvio–deltaic Aldebaran Sandstone. Between the Aldebaran and Freitag formations there is a hiatus (Power, 1966), indicating tectonism followed by erosion, which may also have been responsible for an unconformity and absence of Gebbie-equivalent rocks in the Moura–Cracow region in the southeast. Towards the end of Back Creek Group time, deltaic progradation from the north laid down the coals and clastics of the German Creek Formation in the north, west, and central regions, until the transgression of the MacMillan Formation interrupted these conditions. Renewed deltaic progradation allowed coal measure accumulation to be resumed, leading to the deposition of the Blackwater Group, which became increasingly fluvial in character, except for a short-lived brackish incursion in the lower Burngrove Formation. The upper coal measures came to be overlain in turn by the fluvial Rewan Group.

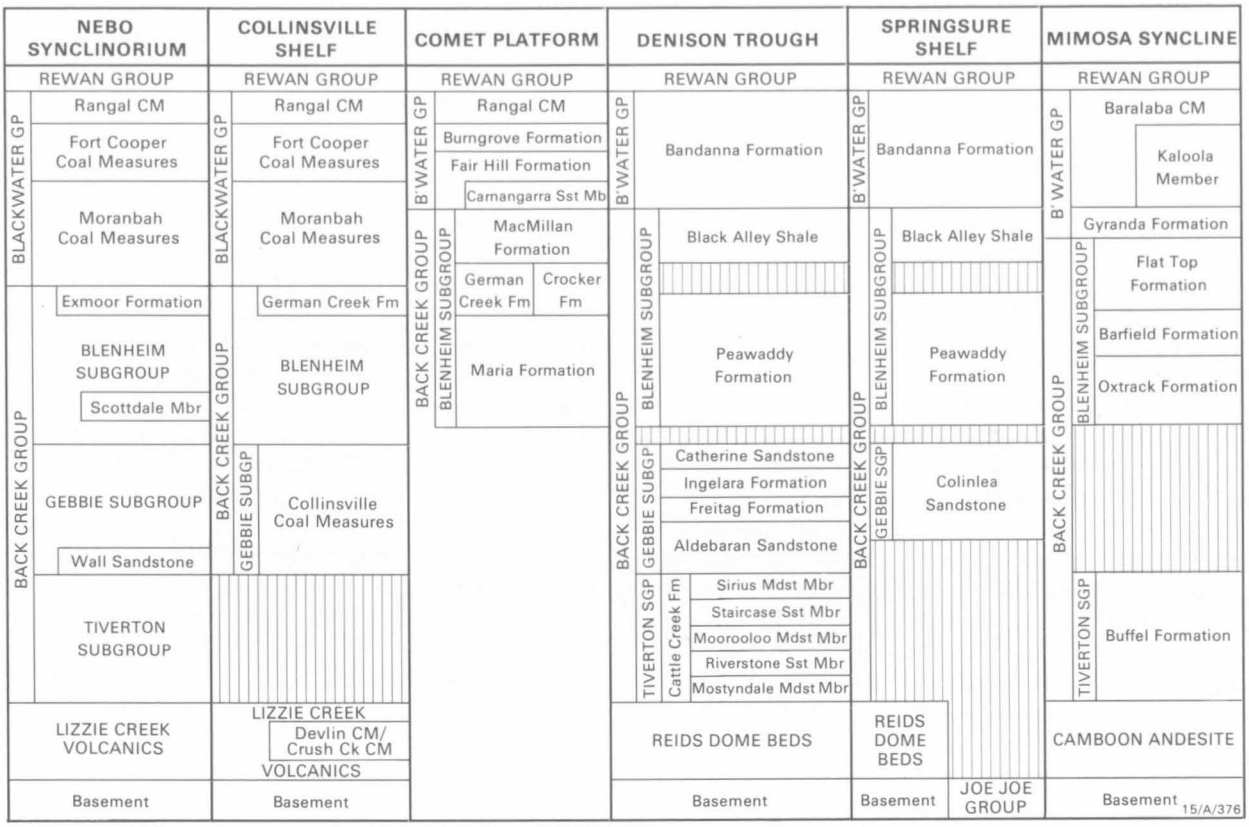

Fig. 7–4. Tabulation of stratigraphic nomenclature in the Bowen Basin north of 26° latitude. Thickness and time duration of units are not to scale, and detailed facies relationships are not shown.

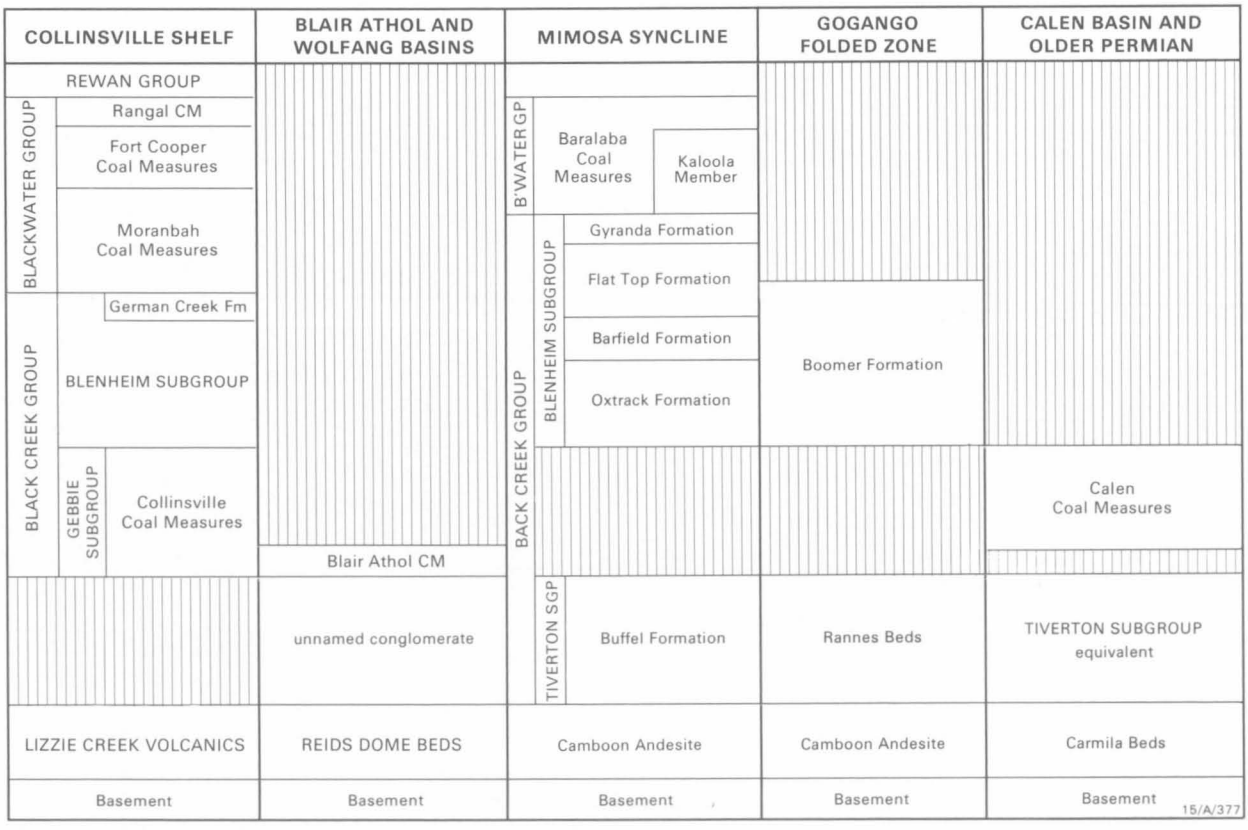

Fig. 7–5. Tabulation of stratigraphic nomenclature of Permian sequences in areas adjacent to the Bowen Basin, compared to nearby Bowen Basin sequences.

Intra-Basinal Correlation

The correlations in Fig. 7–4 and Plate 3 are based on those of Dickins & Malone (1973), who followed the faunal correlation scheme outlined by Dickins (1964) and Dickins & others (1964). Some amendments have been made following Brakel (1983) and Dickins (1983).

The lack of Permian outcrop continuity between the Denison Trough, Mimosa Syncline, and the rest of the Bowen Basin has permitted disagreements to arise over correlation between these areas. Unfortunately, palynology is of limited use here because of carbonization (and therefore non-preservation) of spores and pollens in the central and northern parts of the basin. Opinions are most sharply divided over the stratigraphic ranges of Faunas II, III, and IV in the Denison Trough. Dickins (1969) placed the Cattle Creek Formation in the Fauna II zone, and hence equivalent to the Tiverton Subgroup; the Aldebaran to Catherine interval was equated with Fauna III and the Gebbie Subgroup; and the Peawaddy to Black Alley interval was placed in Fauna IV and equivalent to the Blenheim Subgroup. Dickins (pers. comm.) would now extend Fauna III down the stratigraphic column to include the Sirius Mudstone Member. Waterhouse & Jell (1983) are in broad agreement with the above faunal correlations, but consider that the Catherine Sandstone belongs in Fauna IV. Dear (1972) and McClung (1981a), however, depart markedly from the Dickins zonation by placing the Fauna III/Fauna IV boundary within the upper Aldebaran Sandstone, and the Fauna II/Fauna III boundary within the upper Cattle Creek Formation.

The lack of agreement among palaeontologists has some important implications for stratigraphic correlation. For example, the Comet Platform–Denison Trough correlation shown in Fig. 7–4, proposed by Devine & Power (1967) and consistent with the Dickins zonation, differs substantially from that proposed by Anderson (1971) (Fig. 7–6),

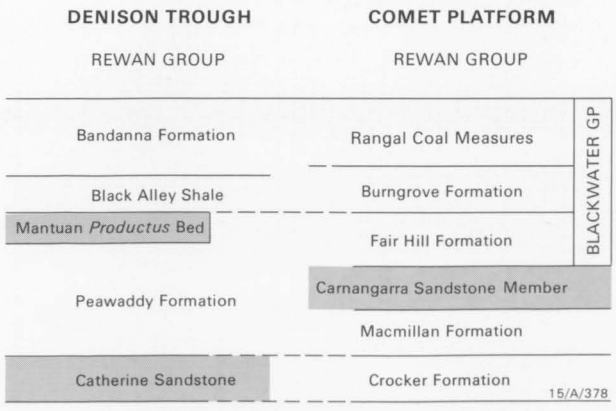

Fig. 7–6. Rock unit correlation between the Denison Trough and the Comet Platform (after Anderson, 1971), using currently accepted formation names.

which can only be correct if the McClung (1981a) faunal positions are accepted. Correlation of the German Creek and Crocker Formations (Fauna IV) with the Catherine Sandstone is impossible, if the latter lies within Fauna III as claimed by Dickins. A further development has been the recognition of the *havilensis*, *pelicannensis* and *magna* zones within Fauna IV (Dickins, 1983); the Catherine Sandstone lies below the *pelicanensis* zone (the Pelican Creek and Scottville faunas of Dear, 1972), whereas the German Creek and Crocker Formations lie stratigraphically higher, within the *havilensis* zone (the Havilah fauna of Dear, 1972). For this reason, a German Creek–Catherine correlation is not accepted in this report, despite its popularity with many authors. Waterhouse & Jell (1983) also reject such a correlation.

The effect on the structure contour maps of a German Creek–Catherine correlation would be minimal. Only Plate 6 would be affected, and because it shows contours for the base of upper coal measures regardless of the identity of coal measure units, no change would take place except for a discontinuity in the contours where coal seams in the German Creek/Crocker Formation lens out. The contours would then have to jump to a higher level to the base of the coal-bearing interval between 524 m and 652 m in AFO Arcturus 1 (and its equivalents), just as there is such a jump (to the base of the Bandanna Formation) south of where this interval in turn lenses out.

Another major difference between the Devine & Power (1967) and Anderson (1971) correlations concerns whether the Black Alley Shale is equivalent to the MacMillan Formation or the lower part of the Burngrove Formation. Anderson's (1971) Black Alley–Burngrove correlation was based on a comparison of gamma logs between GSQ Emerald NS 187 and AFO Struan 1, lithologic comparisons, formation thicknesses, and the nature of coal seams and accompanying tuffs. However, as pointed out by Brakel (1983), the published gamma log correlations between Struan 1 and Emerald NS 187 are not definitive, a plausible alternative being to correlate the Black Alley Shale with the MacMillan Formation, following Devine & Power (1967). Formation thicknesses are not necessarily maintained over a distance as great as the 80 km between the two bores, and if there has been erosion at the base of the Rewan Group, a possibility indicated by Anderson (1971), the thickness of the Bandanna Formation may have been reduced. Coal seams can change quite rapidly in thickness and dirt content along strike, and cannot reliably be used for long-distance correlation.

Two specific attempts have been made to resolve this ongoing problem conclusively. The writer, accompanied by J.M. Dickins, sampled the type section of the MacMillan Formation at several levels, and submitted them for examination for foraminifera to V. Palmieri. For a MacMillan–

Black Alley correlation, any foraminifer assemblage would have to be similar to the C3 assemblage found by Palmieri (1983) in the Denison Trough. If a C2 assemblage had been found, a correlation with the basal Peawaddy Formation would have been implied and a Black Alley equivalence ruled out. Unfortunately, the samples proved to be barren. This negative evidence is consistent with the fact that most of the Black Alley Shale does not appear to contain foraminifera, but it is of course not conclusive. Another attempt, this time with P.L. Price, involved sampling the MacMillan and Burngrove Formations in the GSQ Talbot NS 851 bore, about 50 km north of Emerald. The position of the P3c acritarch swarm would have determined the formation that is equivalent to the Black Alley Shale, which contains this zone at its base. These samples too proved to be barren of microfossils, and so this correlation question remains open.

The correlation of the Black Alley Shale affects both the structure contour map of the base of the Newcastle Coal Measures and equivalents (Plate 10), and the isopach map of the Newcastle Coal Measures equivalents (Plate 12), because the top of the Dempsey Formation underlying the Newcastle Coal Measures is correlated with the top of the Black Alley Shale (see Chapter 17), which, in turn, is correlated with the top of the MacMillan Formation. If a Black Alley–Burngrove correlation is preferred instead, the area underlain by the MacMillan Formation would be affected on these two maps. In the case of the structure contour map, the appropriate level to contour would then be the top of the marine/brackish lower portion of the Burngrove Formation. This would pose difficulties as this level is not identified on bore logs. An approximation can be obtained by using data for the base of the Rangal Coal Measures instead. The isopach map would be affected for the same area, and thicknesses would have to be reduced by taking only the Rangal–Upper Burngrove interval, or approximately, just the Rangal Coal Measures.

There are also differing views on the correlation of the Moura–Cracow region with the rest of the basin, but only the coal-bearing interval at the top of the Permian is relevant to this report. The Gyranda Formation, usually included with the Blackwater Group, is not here considered part of the coal measures, because it contains no coal, and has been interpreted as a marine sequence (C. Herbert, pers. comm.). Whether the base of the Baralaba Coal Measures equates with the base of the Fair Hill Formation (Fig. 7–4, and Brakel, 1983) or with the upper Burngrove Formation (Anderson, 1978), will affect neither the structure contour map of Plate 10, nor the isopach map of Plate 12.

Depositional Environments of Coal Measures Units

The palaeo-environments of the Permian coal-bearing formations of the Bowen Basin have been described by various authors as cited below.

Reids Dome beds

Interpreted environments	Reference
Fresh-water swamps in rapidly subsiding Denison Trough	Mollan & others (1969)
Shallow swamp water	Gray (1976)
Lacustrine to paludal	Heywood (1977b)
Paludal and deltaic. Upper Reids Dome beds represent a delta plain setting adjacent to the marine environment of the Cattle Creek Formation	Gray (1980)
Alluvial fan, upper flood plain, lower flood plain, lacustrine, and delta plain conditions	McClung (1981b)
Meandering and braided stream, lake, and alluvial fan facies. Many sub-environments interpreted	Fleming (1982)
Alluvial fan, talus slope, braided stream, meandering stream, swamp, lacustrine, upper delta plain, fan delta, back barrier, and coastal plain deposition. Alluvial fans show evidence of tectonically reactivated marginal scarps. Sub-environments (permanent and intermittent swamps, channels, levees) also recognized.	Draper & Beeston (1985)

The last three represent the most detailed sedimentation studies. The work by Draper & Beeston (1985) continued and updated that reported by the previous two writers.

Collinsville Coal Measures

Deltaic or paludal. Glendoo Sandstone Member formed during a marine transgression	Malone & others (1966)
Coastal swamps, deltaic flood plain	Dickins & Malone (1973)
Non-marine facies of a delta system	Staines & Koppe (1979)

Isopachs and the coarseness of detritus suggest an alluvial fan debouching into a marine embayment as a fan delta. Various paralic sub-environments are likely to be represented. The marine interlude of the Glendoo Sandstone Member interrupted sub-aerial sedimentation.

Aldebaran Sandstone

Shallow, fresh-water torrential deposition, with minor marine incursions	Derrington (1957)
Deltaic–estuarine shallow water	Mines Administration (1964)
Brackish deltaic setting, progradation of deltaic sands alternated with slow silty sedimentation	Mollan & others (1969)
Mainly deltaic, partly brackish, rarely fluvial, environment	Dickins & Malone (1973)
Regressive sequence, brackish water, deltaic	Gray (1976)
Deposited during an extensive regression, lower beds marine in part	Gray (1980)

Deposition took place as a sandy delta, grading upwards and northwards from prodelta marine sands through to coarser fluvials.

Blair Athol Coal Measures

Non-marine deposition in small intermontane basin	Foster (1979)
Freshwater lacustrine	Carr (1980a)
Raised peat bog within a topographic depression	Smyth (1980)

The setting appears to have been generally fluvial within a small intermontane basin. With time, a shallow lake formed which became clogged with peat, leading to the formation of a raised bog in the topographic depression; the resulting thick peat became the Big Seam.

German Creek and Crocker Formations

Deposited in a marine, and at times, brackish delta	Dickins & Malone (1973)
Shallow marine, then gradual regression	Park (1973)
Regressive. Lower part mostly terrestrial with minor marine incursions. Upper part terrestrial and marshy, with coal cyclothems	Zillman (1976)
Partly fluvial, partly deltaic, minor marine. Deposited in fluvial channels, alluvial fans, tidal flats, and coal swamps. Regressive, with minor marine incursions	Prouza (1977)

A lower delta plain with interdistributary bay intercalations is indicated for the central basin. Fluvial influence increases to the north, and there is a decreasing proportion of marine deposits in upper part of the interval southwards. The Crocker Formation has a higher proportion of marine sediments than the German Creek Formation.

Exmoor Formation

Variety of nearshore environments as marine influence declined	Koppe (1974)
Paralic	Koppe & Scott (1979)

The formation represents the transition zone from marine to non-marine deposition, as the sea gradually contracted southwards.

Moranbah Coal Measures

Fluvial flood plain; deposition in stream channels, shallow lakes, swamps, and crevasse splays	Wallin & Koppe (1978)
Fluvial flood plain. Marginal volcanic activity	Staines & Koppe (1979)
Prodelta, barrier, back-barrier, lower delta plain, transitional delta plain, and upper delta plain facies, with several sub-environments recognized. Interpreted as representing a deltaic complex subject to delta switching with resultant localized marine incursions	Holmes (1983)

The fluvial deposits of the north give way southwards to more paralic ones down the palaeoslope.

Fort Cooper Coal Measures

Fluvial channels and overbank environment associated with swamps. Localized piedmont conditions, and contemporaneous volcanic activity	Koppe (1973)
Fluvial. Marginal volcanic activity	Staines & Koppe (1979)

A piedmont and upper alluvial plain setting is interpreted, proximal to source areas where volcanoes were active and distributing abundant air-fall tuff over the region.

Fair Hill Formation

Sub-aerial deltaic with prolonged periods of peat swamp development. Pyroclastic activity common	Park (1973)

Deltaic and fluvial facies, partly transitional marine at base. Deposition in channels, bars, alluvial and coastal plains, coal swamps, and beaches	Prouza (1977)

Delta sedimentation was prograding across the marine embayment occupied by the MacMillan incursion. A significant contribution of air-fall tuff from distant eruptive centres is evident.

Burngrove Formation

Initial rapid marine transgression producing a basal open-shelf facies. Followed by a regressive phase with delta front and sub- aerial delta deposition. Pyroclastic activity intense	Park (1973)
Lacustrine	Jensen (1975)
Basal euxinic lake or lagoon, possibly shallow sea in south. Transitional unit probably accumulated on an alluvial or tidal plain. Upper unit mostly lacustrine and partly fluvio-lacustrine	Prouza (1977)
Basal euxinic lagoon environment. Upper unit deposited in nearshore marshes and swamps	Zillman (1978)
Lower interval probably represents paralic extension of a marine incursion	Koppe (1978)

A relative rise in sea level, probably tectonically induced, brought marine/brackish sedimentation in its wake. This was followed by deltaic progradation infilling the affected region, and lower delta plain conditions prevailed, probably including lacustrine sub-environments. Large volumes of volcanic ash were dropped into the basin during the second half of the interval.

Rangal Coal Measures

Sub-aerial deltaic; continental at the top of the formation	Park (1973)
Meandering streams and flood plain lakes	Jensen (1975)
Deltaic regime (partly fluvial and partly paludal)	Prouza (1977)
Predominantly deltaic environment, some deposition on alluvial plains	Zillman (1978)
South-flowing streams	Staines & Koppe (1979)

Deltaic facies, coming under increasing fluvial influence upwards and northwards. Cyclothems suggest that meandering streams were common. Notable amounts of tuff continued to be added to the sequence from volcanoes beyond the basin margin, probably to the east.

Baralaba Coal Measures

Shallow lacustrine milieu	Olgers & others (1966)
Freshwater swamps, and fluvial	Mollan & others (1972)
Fresh and/or brackish water; lacustrine	Gray & Heywood (1978)
Large, long-ranging peat swamp, with occasional incursions of terrigenous sediment associated with migrating distributary channels; other sub-environments are overbank splays, sub-aqueous and sub-aerial levees, and lakes	Mallett (1983)

The most detailed study has been carried out by Mallett (1983). High boron in the coals suggests a marine to brackish influence (Swaine, 1971). The Kaloola Member at the base of the unit consists largely of pyroclastic detritus.

Bandanna Formation

Paludal and fluvial	Mollan & others (1969)
Widespread paludal and lacustrine conditions during a major regression	Gray (1980)
Low-lying, brackish, swampy, marshy plain setting in deltas, dissected by fluvial channels. Sub-environments interpreted include distributary mouth bar, interdistributary bay, channel, channel fill, crevasse splay, flood plain and overbank marsh	Draper (1982), Draper & McClung (1983)

The only published detailed studies of the sedimentation appear to be those by Draper (1982) and Draper & McClung (1983).

Structure Contour and Isopach Maps

Structure contours were drawn for seven litho-stratigraphic horizons in the Bowen Basin, and are shown on the relevant 1:2 500 000 maps for

eastern Australia (Plates 4–7 and 9–11). The horizons are the bases and tops of the Reids Dome beds, the middle coal measures, and the upper coal measures, and the base of the Fair Hill Formation and equivalents. To show detail more clearly, the structure contours for the Reids Dome beds have also been reproduced as Figs 7–8 and 7–9 at a scale of 1:1 000 000. All elevations on the maps are given in metres above mean sea level. The horizons selected for contouring were used because they are the bases or tops of the main coal-bearing intervals, or in the case of the Fair Hill Formation base, because it is believed to represent the top of a eustatic sea-level highstand within the upper coal measures, equivalent to the base of the Newcastle Coal Measures in the Sydney Basin.

Two isopach maps have also been compiled: one for the middle coal measures (Plate 8) and the other for the Newcastle Coal Measures equivalents (Plate 12).

A total of 152 first-order control points in the Bowen Basin north of 26° latitude, and in the minor basins north of Clermont, have been used to construct the contours. The points chiefly use information from petroleum exploration, coal, and stratigraphic bores, but also include data from outcrop sections where appropriate. Locations of control points are shown on the Bowen Basin Control Point Distribution chart (Plate 37), while the relevant information for each point is given on microfiches 1 and 2. At the onset of the project, a decision was made to adopt an average control-point spacing of 25 km for all basins. However, the spacing is greater than this where information is sparse; conversely, selected points are closer together where geological conditions show rapid lateral change, or where one drill intersection or outcrop does not display the full lithological sequence and needs to be complemented by data from one or more nearby points. Coverage is therefore good in the main areas of coal mining and exploration for coal and petroleum, but poor along the western margin near Capella, and in a broad belt extending from the deep central portion of the Mimosa Syncline northwards along the eastern side of the basin, including the area of the Duaringa Basin and the two folded zones. In addition, supplementary seismic information was used in the Denison Trough and the Mimosa Syncline. Locally, some gaps were filled by approximate elevations from geological maps and topographic contours. Some faults, and some extensions of known faults, have been inferred.

Consecutive structure contour maps for the base and top of a coal measure interval were compared and reconciled to ensure that there are no artefacts of the plotting which result in implied negative thicknesses for a unit. Likewise, isopach maps were cross-checked with structure contours on the bounding horizons, to be certain that they are mutually consistent.

Structure Contours

Base of Reids Dome beds (Plate 4 and Fig. 7–8)

Control on the base of the Reids Dome beds is generally poor, because the base is nowhere exposed, and no bores have penetrated the thick succession in the Denison Trough. Two bores at the southern end of the trough, AAO's Glentulloch 1 and Killoran 1 (Fig. 7–7), have reached pre-Permian basement because the unit is thin there, or in the case of Killoran 1, absent. The structurally high areas along the east and west sides of the trough have better control, because the Permian sequence as a whole is thinner, so that basement is within easier reach of bores. In addition, company seismic work around some petroleum exploration wells, and the extensive BMR seismic traverses (Bauer & Nelson, 1980; Bauer & Dixon, 1981; Nelson & Bauer, 1981; Dixon & Bauer, 1982) were used. Within the deep Denison Trough, no reliable basal Permian reflector can be identified, and the speculative base of Permian, suggested by Bauer & Dixon (1981), is shown as dashed contours. North of Springsure, no reliable data were available for the trough when the map was compiled.

The Denison Trough shows up as a deep graben bounded on the west by the Merivale Fault, with its deepest part reaching perhaps more than 5000 m below sea level. The southeastern margin is a series of step faults. Northwards, the trough takes on more of the nature of a half graben as the floor tilts increasingly to the west. In the Rolleston area, the trough widens by more than three times because of the juxtaposition of a series of half grabens with westerly dipping floors. Immediately south of this area, the basement forming the Bonnie Doon Ridge rises to a broad platform, which culminates in a north-northwesterly trending high at the AA0 7 Arcadia well. West of the high, on the platform near PEC Warrinilla 1, is a depression, namely the "Arcadia Embayment" of Nelson & Bauer (1981), which however does not appear to join the main trough to the west, as these authors suggest. The trends on the Bonnie Doon Ridge lie at a low angle to the main Denison Trough, implying that the trough formed as a pull-apart basin (like the Dead Sea) within a dextral strike-slip fault system (H.J. Harrington, pers. comm.). The Comet Platform does not have Reids Dome beds except at APN Cometside 1, and appears to be separated from the Bonnie Doon Ridge by a low extending from the trough in the Rolleston area.

Reids Dome equivalents occur in the Wolfang and Karin Basins (Carr, 1980a; Cook & Taylor, 1979), but can only be shown as spot elevations. The coal measures intersected in UKA Burunga 1 between 2812 m and 2993 m (2660 m below sea level) are presumed to be Reids Dome equivalents also.

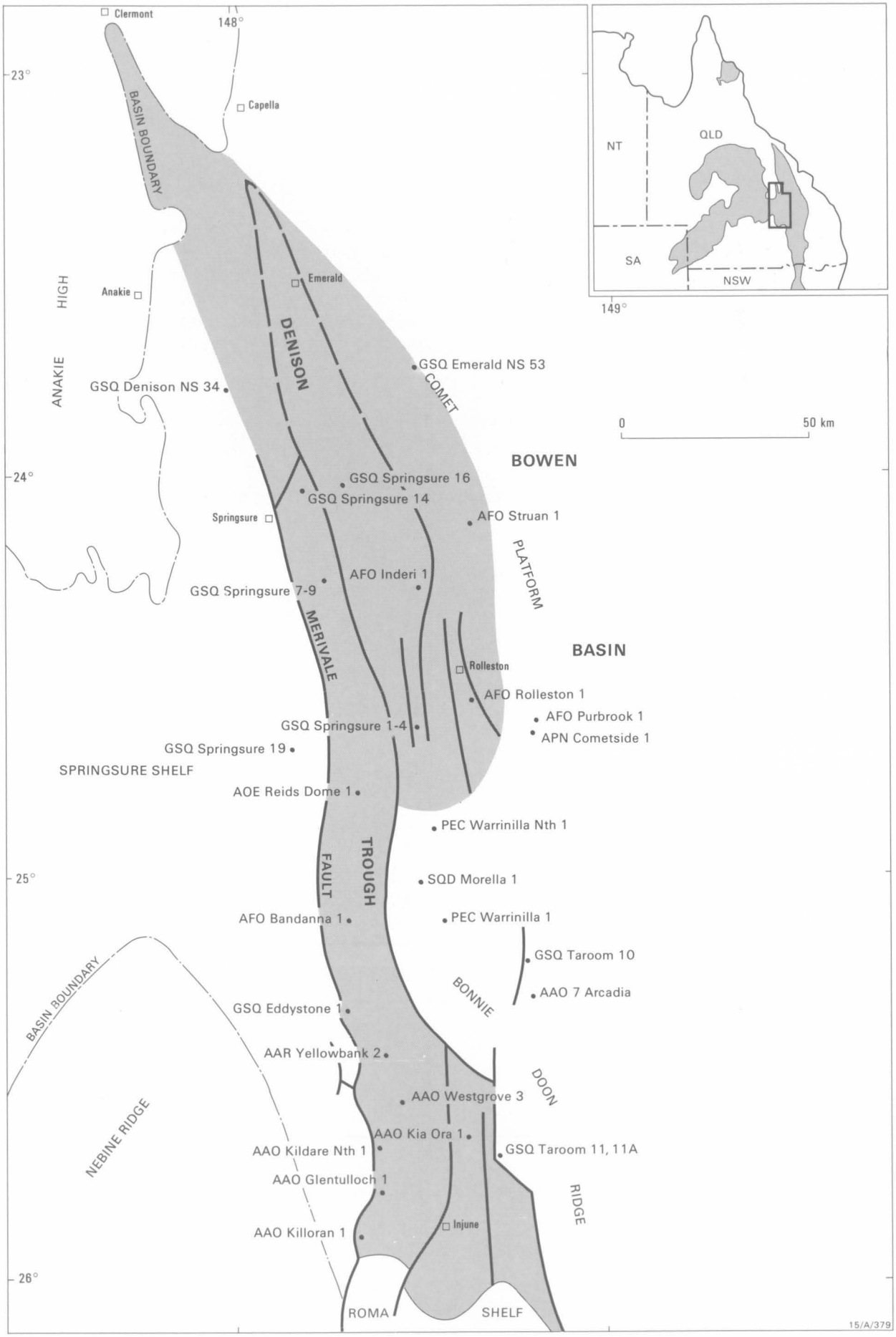

Fig. 7–7. Location of major faults and selected drillhole sites in the Denison Trough.

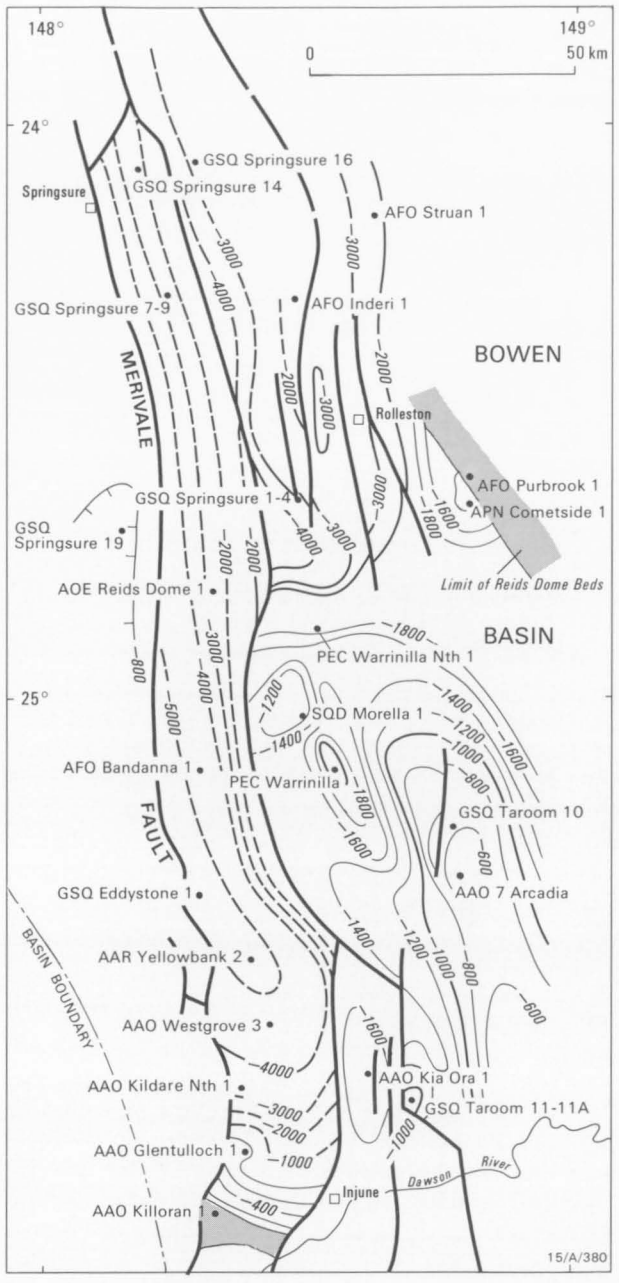

Fig. 7–8. Structure contours, base of Reids Dome beds.

In the rest of the Bowen Basin, the contemporaneous deposits are the Lizzie Creek Volcanics and equivalents, which do not have coal measures except for small lenticular occurrences such as the Devlin Coal Measures.

Top of Reids Dome beds (Plate 5 and Fig. 7–9)

Twenty-six first-order control points have been used to plot the structure contours for the top of the Reids Dome beds; all but two bores have intersected the horizon, the remaining ones indicating where the unit has lensed out. The bores are either rotary drill petroleum exploration wells, or cored GSQ stratigraphic diamond drill holes. As for the previous map, Fig. 7–8, company and BMR seismic work in the Denison Trough provided additional information. Again, spot elevations are given for the Karin and Wolfang Basins, and Burunga 1.

The contour pattern differs markedly from that of the base of the Reids Dome beds indicating that the Denison Trough had largely been filled by the coal measure sequence. The contours also reflect Triassic folds, such as the Springsure Anticline, on a meridional trend. The filling of the graben by the end of Reids Dome time is shown clearly by the seismic results of Bauer & Dixon (1981), on which the cross-sections of Plate 14 are based. The Comet

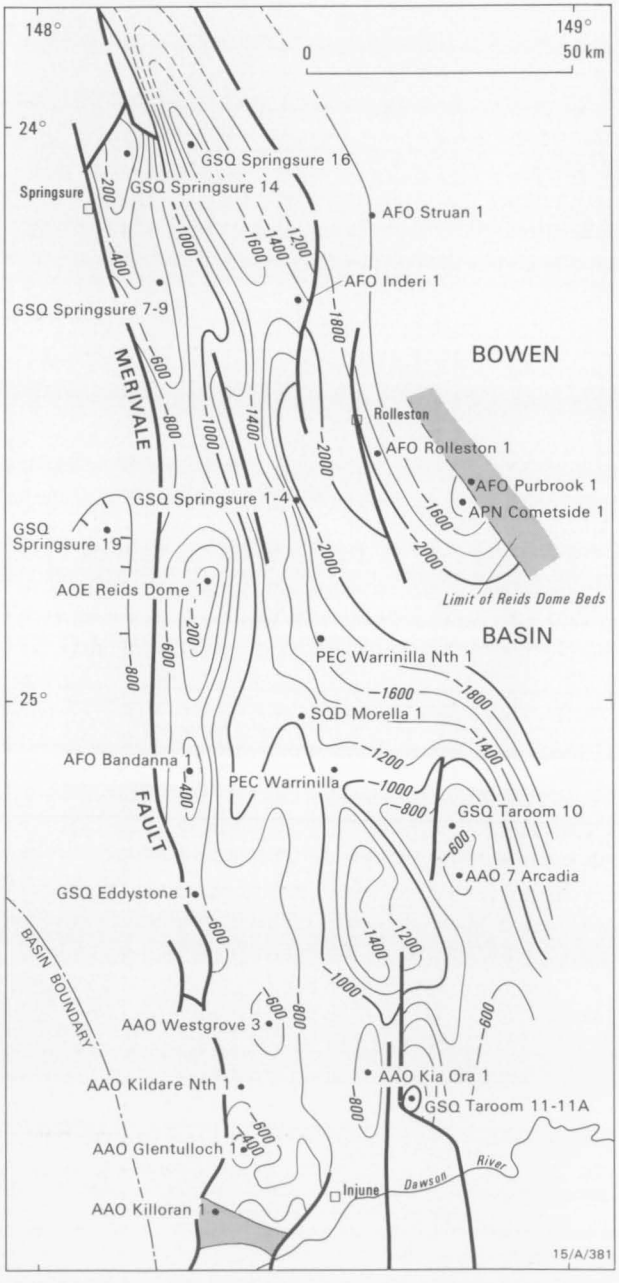

Fig. 7–9. Structure contours, top of Reids Dome beds.

and Bonnie Doon ridges, and the intervening low, still feature at this level, but they do not stand out as high above the main trough to the west as previously. The "Arcadia Embayment" topography has been inverted, being replaced by the swell of the Bullaroo Monocline (Nelson & Bauer, 1981). The Triassic folds, which at a higher stratigraphic level are truncated by the overlying Jurassic Surat Basin sequence (Nelson & Bauer, 1980), were formed during a compressive event. Bauer & Nelson (1980) have convincingly explained the mechanism of deformation as a combination of flexuring of the sedimentary pile in the graben and thrusting on the bounding faults, as the flanking basement blocks moved towards each other. It should be noted that the compression need not have been normal to the trough to produce the observed effect; oblique stress would move the basement blocks closer together and still give rise to meridional folds if the sediments behaved incompetently relative to the basement.

The map is a guide to the depth of the coal measures; it can be seen that except for around Reids Dome and north of Springsure, where the unit crops out, coal is too deep to be economic. It may nevertheless have potential for future underground coal gasification (UCG).

Base of Middle Coal Measures (Plate 6)

The middle coal measures of the Bowen Basin comprise the Collinsville Coal Measures, Blair Athol Coal Measures, Aldebaran Sandstone, the adjacent portion of the Colinlea Sandstone, and the Rugby coals southwest of Moranbah. The Aldebaran and Colinlea Sandstones are not coal measure sequences, but have been included because they contain coal lenses at various levels. Thirty-eight control points have been used, as well as seismic data. The bores in the Rugby area are water bores, while the other control points are coal, petroleum or stratigraphic holes. Spot heights are given for the Blair Athol Coal Measures in the Blair Athol and Wolfang Basins.

The Collinsville Coal Measures at the northern end of the basin dip easterly and southerly into the basin. Faulting near the basin axis has upthrown the unit to 418 m below sea level in TEPL Rosella Creek 1. The coal measures of the Rugby area also display a basinward dip; it is assumed that the occurrences at the three control points are part of one continuous unit. The Rugby coals are probably the southerly extension along the western basin margin of the Collinsville Coal Measures. Along the eastern margin, the coal measures lens out in the marine Gebbie Subgroup about 25 km southeast of Collinsville.

The major structure dominating the Aldebaran Sandstone in the Denison Trough is the Triassic Springsure Anticline, with its two culminations in the Springsure area and Reids Dome. The Consuelo Anticline is also present, but more subdued. To the east lies a faulted structural low, flanked in turn by the Comet Platform. The Aldebaran lenses out towards Injune, after first grading from a deltaic to a prodelta marine deposit. West of the Denison Trough, the Colinlea Sandstone on the Springsure Shelf dips gently off the Anakie High. In the southwestern region, the contours have been extrapolated across areas where the units have been eroded away.

Top of Middle Coal Measures (Plate 7)

The structure contours for this horizon form patterns similar to those for the base of the middle coal measures. That this should be so for the Aldebaran Sandstone indicates that the effects of the Triassic folding greatly exceed those of thickness variations. The Comet Platform persists as a pronounced feature, because the underlying basement behaved as a rigid block while the sediments in the adjacent troughs were less competent and became deformed. The magnitude of the folding was such that the crest of the Springsure Anticline came to stand much higher (>200 m above SL) than the Comet Platform (23 m below SL).

Base of Upper Coal Measures (Plate 9)

In the northern and central Bowen Basin, the base of the upper coal measures corresponds to the base of the German Creek, Crocker, Moranbah, and Exmoor formations, whichever is the lowest. Farther south, the German Creek/Crocker sequence lenses out, so the coal measures base has to jump to a higher level, namely to the base of the Baralaba and Bandanna formations. The position where this happens is indicated on the chart by a double line. The coal measures are absent on the Bonnie Doon Ridge east of Injune, and are likewise absent in a strip along the eastern basin margin south of Theodore.

The 94 first-order control points used represent stratigraphic, petroleum, and coal drill holes, and some measured outcrop sections. They are supplemented in the north by some second-order points from geologic and topographic maps, and in the south by seismic information, including company seismic traverses across the Mimosa Syncline between the AFO Sunlight 1 and TEPL Moura 1 wells, on which the cross-section in Plate 15 is based. Coverage in coal mining areas is fairly dense, but by contrast is nil in much of the eastern sector. Forty-four bores, mostly located in the Goonyella–Blackwater region, do not reach the horizon, but are still useful because they give a minimum depth below which it must lie. Little

depth information is available for the intensely deformed Dawson Folded Zone, and faulting is almost certainly more complex than shown. Similarly, there are known to be many faults of relatively small displacement in the Mimosa Syncline. Because no drill hole data exist from the central portion of the syncline, the contours there are drawn according to depth estimates derived from the seismic work.

For the first time, coal measures have an almost basin-wide distribution, and the principal structural elements can be recognized. The most profound structure is the large Mimosa Syncline, which at its deepest plunges to over 6 km below sea level. The Goondiwindi–Burunga fault system extends into its eastern side from the south, but it is uncertain how far north these faults reach. The western flank of the syncline adjoins the Collinsville–Comet High, which at this level has only a saddle dividing the Comet Platform from the Bonnie Doon Ridge.

In the Denison Trough, the Springsure and Consuelo Anticlines are prominent. The northern part of the trough is faulted near Emerald, one fault disrupting the western side of a wide syncline between the Springsure Anticline and the Comet Platform.

Around Blackwater, the Comet Platform displays two low domes. The southerly extension of the German Creek Formation (the 524–652 m coal-bearing interval in Arcturus 1), the limit of which is indicated by the double line on Plate 9, has a distribution coinciding with the Comet Platform. This implies a contemporaneous structural high on which subaerial deltaic coal measures could accumulate, while adjacent lower regions were too deep to be filled and therefore remained marine until base-of-Bandanna time.

The Collinsville Shelf forms a high area along the western basin margin, and is especially wide where it passes southward into the Comet Platform, in an area which has been referred to as the Capella Block.

The Nebo Synclinorium in the north of the basin reaches a depth of about 1400 m below SL in its axial region. While this is quite deep for this part of the Bowen Basin, it is only about a quarter of the depth of the Mimosa Syncline at the other end of the Taroom Trough. There is elongate folding on its eastern side north of the dome at 22° latitude; the dome itself is caused by the circular intrusion of the Cretaceous Bundarra Granodiorite.

The complex fault zone associated with the formation of the Dawson Folded Zone in the Triassic, extends for over 500 km from Moura, through the centre of the basin to the Collinsville area and beyond. Some of the component faults are the Burton Downs Fault (northern area), and the Umolo and Jellinbah Faults (central area). This faulting has broken the zone into numerous blocks, in which the occurrence and depth of coal measures is difficult to predict without exploratory drilling.

Base of Fair Hill Formation and equivalents (Plate 10)

The horizon contoured is the base of the Fair Hill, Fort Cooper, Baralaba, and Bandanna formations. It is correlated with the base of the Newcastle Coal Measures in the Sydney Basin, and marks a return to coal measures deposition after a eustatic sea level highstand. As discussed earlier, disagreements over correlations will affect the map to the extent of deciding which level is equivalent to the Newcastle Coal Measures.

Control on the structure contours is similar to that of the previous map, in this case 60 primary control points being used. Twenty of these, located mainly in the central basin, do not reach the horizon and indicate only a minimum depth. Because the coal measures are absent on the Bonnie Doon Ridge east of Injune, and also in a strip along the eastern basin margin south of Theodore, the horizon cannot be contoured in these areas.

The structural features portrayed are very similar to those on the previous chart (Plate 9). The syncline, extending for over 180 km from Emerald to south of Rolleston, plunges to about 800 m below SL west of Rolleston. It is a post-Permian structure, at least in part. Coal measure deposition was no longer restricted to the adjacent Comet Platform, but was able to spread across adjoining regions, now that these former deep areas had been filled with sediment.

Top of Upper Coal Measures (Plate 11)

The structure contours for the top of the upper coal measures rely on 62 first-order control points, and supplementary data where appropriate. The distribution and types of control points are similar to those of Plates 9 and 10. The unit is again absent on the southeastern margin, and on part of the Bonnie Doon Ridge. The area that can be contoured is reduced in comparison to the previous map, especially in the northern half of the basin, because the Triassic cover and the top of the coal measures has been eroded off in several regions. In the central areas and near Springsure, attempts have been made to interpret pre-erosion contours, shown by dashed lines.

The overall morphology of the Bowen Basin is retained on this map, and the major structural elements present at lower levels persist upwards. The northern end of the syncline east of Emerald has a different shape, with the deepest portion now being adjacent to the main fault, and implying that the pattern of subsidence changed, perhaps influenced by growth faulting. The map is an approximate guide to the depth of the coal measures; it can be seen that the unit is, as expected, shallowest around outcrop areas on the

southeast margin, in the centre and north, and in the southwest. There are also shallow areas on the Comet Platform as far south as the Rolleston and Cometside 1 bores, and on the Bonnie Doon Ridge around AAO 7 Arcadia, where the top of the Bandanna Formation was encountered 105 m below ground surface. The deepest point in the Mimosa Syncline is estimated to be about 5400 m below SL.

Isopachs

Middle Coal Measures (Plate 8)

To construct the isopach map for the middle coal measures, 36 first-order control points were employed. Figure 7 of Gray (1980) was also used, with minor amendments, for the southern half of the Aldebaran Sandstone, but the southernmost portion of this unit is prodelta-marine and has not been contoured. The contours in the northern Denison Trough are uncertain. Only spot thicknesses can be given for the Blair Athol and Wolfang Basins.

The Collinsville Coal Measures in the north display a rapid thinning from west to east, lensing out southeast of Collinsville. The unit appears to be a clastic wedge of alluvial fan origin, exceeding 420 m thickness in the west, from where most of the detritus was derived. The contours appear to swing to the northeast near the eastern basin margin, perhaps because of some sediment supply from the north along the basin axis.

In the Rugby area, the bores closest to the basin edge have coal measures more than 50 m thick, whereas Cherwell Bore somewhat farther into the basin has 38 m, suggesting a basinward thinning.

The Aldebaran Sandstone contains coal only as minor lenses which occur irregularly at various levels. The depocentre of the unit is in the Denison Trough southeast of Springsure, where the thickness exceeds 780 m. The sand body has a north–south elongation, conforming to the shape of the Denison Trough rather than having a classic delta morphology. The geometry of the deposit indicates that the sand first filled the depression in the trough as it then existed, and only thereafter overlapped the trough margins, including the Comet Platform. As a result, the shape bears no relation to the direction of clastic input. Derivation of such a large volume of sediment from the Anakie High seems unlikely, so the main source presumably lay to the west, the sand being carried in by a river draining the Galilee Basin west of the Springsure Shelf. There must have been some subsidence to accommodate the deposit, most markedly in the depocentre, but as the cross-sections of Plate 14 show, the amount of subsidence was small compared to that of Reids Dome times. Whereas the graben-filling portion of the Reids Dome beds has a prismatic geometry, later formations are blanket like.

Newcastle Coal Measures equivalents (Plate 12)

The isopachs of this map include those of the Fair Hill to Rangal interval, and the Fort Cooper, Baralaba, and Bandanna formations. They are based on 86 primary control points, including 53 partial thicknesses. Some secondary points were used where required, as well as thickness differences where the structure contours of Plate 10 (base of Fair Hill Formation) cross those of Plate 11 (top of upper coal measures).

Comparison with the middle coal measures isopachs shows a major shift in coal-prone sedimentation from the western side of the basin to the eastern side.

Most prominent is the great thickness in the Mimosa Syncline of the Taroom Trough, reaching to over an estimated 900 m. An intersection of 789 m was recorded in UKA Burunga 1. The substantial thickening in the axial region required significant contemporaneous subsidence. Except for the flanking areas, the coal in the syncline is, of course, far too deep to be accessible with present mining technology, but it is a resource for future robot mining and underground coal gasification (UCG).

The next greatest thickness is in the axial region of the Nebo Synclinorium of the Taroom Trough, where an estimated 600 m of the coal measures may occur. This area is poorly known, and the estimate assumes that, like the Mimosa Syncline, axial subsidence was greater than average for the basin.

In the western half of the basin, thicknesses progressively increase easterly from a minimum of 40 m above the Nebine Ridge on the Springsure Shelf to over 400 m in the Taroom Trough. This implies that the western basin behaved as a dipping shelf hinged along its western side, and that there was no longer a tectonic distinction between the Springsure Shelf, Denison Trough, and Collinsville–Comet High, all three elements now acting as a single structural entity.

Conclusions

The beginning of the Permian saw extensive volcanism build up a thick pile of lavas east of the Collinsville–Comet High. Some coal measures and marine sediment lenses were interbedded. Meanwhile, to the west, the Denison Trough formed as a pull-apart basin in a braided strike-slip fault zone, and began accumulating thick coal measures which eventually filled the trough by the end of Reids

Dome beds time. There was some further subsidence on the site later in the Permian, but it was small by comparison; the post-Reids Dome units tend to have tabular geometries, and their enclosed marine sandstones are always shallow-water deposits, as evidenced by *Skolithos* burrows and beach or marine bar sedimentation in the Freitag Formation, the Catherine Sandstone (Brakel, 1983), and the top of the Peawaddy Formation. The later subsidence was greater in the Springsure–Rolleston area than farther south.

After the Cattle Creek–Tiverton marine transgression, the Aldebaran Sandstone delta was built out into the Denison Trough from a westerly source, first filling the low areas of the trough and then spilling over into the adjacent highs. Only minor coals were preserved. In the north, however, economic coals were deposited near Collinsville, in an alluvial fan wedge sourced mainly from the west. Along the western basin margin, near Rugby, similar coal measures, thinning basinward, were laid down. Important coals also accumulated in the Blair Athol and Wolfang Basins at this time. The coal measures deposition in the west contrasts with marine sedimentation in the Taroom Trough, where, as Plate 15 shows, there was greater subsidence than elsewhere throughout most of the Permian. Unconformities between the Aldebaran and Freitag formations (Power, 1966), and between the Buffel and Oxtrack formations (Mollan & others, 1972) point to mid-Permian uplift which exposed the affected regions to erosion, before marine conditions returned.

In the Late Permian, the largely deltaic German Creek Formation heralded the resumption of coal measures deposition. Interseam thickness variations, and vitrinite reflectance data, show that the rate of subsidence was greatest towards the east (Beeston & others, 1979). The southern limit of the unit corresponds to the margins of the Comet Platform, implying that the latter was a structural high on which coal measures could accumulate, while adjacent lower regions were too deep to be filled in, and thus remained marine.

Following the eustatic transgression of the MacMillan Formation, coal measures deposition was established basinwide. The locus of greatest coal formation moved east to the Taroom Trough, where subsidence allowed thicknesses of up to 900 m of coal-bearing beds to be preserved. Apart from minor activity, such as possible growth faulting near Emerald, the only tectonism in the western half of the basin was a down-tilting hinged about the western margin. The Denison Trough and Collinsville–Comet High had therefore ceased to behave as separate structural elements.

During the early Triassic, substantial subsidence continued in the Taroom Trough, as the cross-section in Plate 15 shows. In the mid-Triassic, major tectonism caused thrusting from the east, and folding in much of the Bowen Basin. A large thrust has been detected in the HOM Shotover 1 well by vitrinite reflectance studies (Beeston, 1983), and thrusts have also adversely affected coal mining south of Blackwater. The compression caused large-scale flexure folding and graben–marginal thrusting in the Denison Trough. The most intense deformation was felt in the Dawson and Gogango Folded Zones, where faults and isoclinal folds proliferated. The activity in these zones extended southwards as the Burunga and Goondiwindi Faults. Later, Tertiary tensional forces produced the Duaringa Basin graben.

Coal Deposits

Properties of seams worked, or likely to be worked, are given below. Table 30–1 (accompanying Plate 28) indicates the economic seams at each mine or prospect. Locations of mines and prospects are shown on Plate 28.

BLAIR ATHOL COAL MEASURES–*Big seam*: Medium to high-volatile, subhydrous, subbituminous thermal coal with low ash and sulphur.

COLLINSVILLE COAL MEASURES–*Blake, Bowen, Denison, Scott, and Garrick seams*: Low-volatile, bituminous coal with relatively high sulphur and phosphorous, and medium ash. Coal from all seams except the Blake are considered to be strongly coking. Used for power generation and coking.

GERMAN CREEK FORMATION (EMERALD–GERMAN CREEK AREA)–*Lilyvale seam*: Medium to high-volatile coking coal, with low to medium ash and low sulphur content.
–*German Creek, Tieri, and Aquila seams*: Low to medium-volatile strongly coking coal, low in ash.

GERMAN CREEK FORMATION (NORWICH PARK–GERMAN CREEK AREA) –*Dysart–German Creek and Harrow Creek–Tieri seams*: Low-volatile, strongly coking coals with low ash and sulphur levels.

MORANBAH COAL MEASURES–*Dysart and Harrow Creek seams*: Low-volatile, strongly coking coals with low ash and sulphur.
–*Goonyella (Upper and Lower) seams*: Medium-volatile, strongly coking coals with low ash and sulphur contents.

RANGAL COAL MEASURES (NORTH BOWEN AREA)–*Hynds–Vermont and Elphinstone–Leichhardt–Upper Newlands seams*: Low to medium-volatile, bituminous coking and thermal coals, reaching semi-anthracite rank in the Bee Creek and South Walker Creek districts. The most strongly coking coal is in the Hail Creek district. Low to medium ash contents, and low sulphur.

RANGAL COAL MEASURES (BLACKWATER AREA)–*Argo B, Taurus C, Gemini AC, Pollux AB, Castor A, and Aries seams*: Low ash, low sulphur, medium-volatile coking coal. A higher-ash thermal coal is also produced.

RANGAL COAL MEASURES (BLUFF–YARRABEE AREA)–*Bluff–Main, Cambria, and Excel seams*: Low-volatile semi-anthracites, non-coking, high specific energy, low to moderate sulphur. Some coals at Bluff, on the borderline between semi-anthracite and low-volatile bituminous, have good coking properties. Suitable for industrial and domestic combustion, smelting, gas production, and other special purposes.

BARALABA COAL MEASURES (BARALABA AREA)–*Double, Dunstan, Dawson, Doubtful, and Reid seams*: Low-volatile semi-anthracites, non-coking, high specific energy, low to moderate sulphur. Suitable for industrial and domestic combustion, smelting, gas production, and other special purposes.

BARALABA COAL MEASURES (MOURA–THEODORE AREA)–*A, B, C, and D seams*: High-volatile, weak to medium-coking coal, low in ash and sulphur. A higher-ash non-coking coal is also produced.

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CHAPTER 8

Bowen Basin Beneath the Surat Basin

by
P.E. O'Brien

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Introduction

Location and Data Coverage

This chapter deals with the Bowen Basin between latitude 26°S and its southern extremity at latitude 29°45'S (Plate 2). It is covered by up to 2300 m of Jurassic and Cretaceous sediments and information on the Permian coal-bearing units comes from hydrocarbon exploration. Such exploration has concentrated on plays in the Mesozoic sediments overlying the Permian coal-bearing units; hence, many of the wells do not penetrate the coal measures and those that do are clustered along the western edge of the Bowen Basin. This bias means that large areas along the basin axis are devoid of control points so that seismic surveys were used as guidance for the structure contour and isopach maps.

Previous Literature

Most studies have focussed on the Surat Basin and are reviewed by Allen (1976) and Exon (1976). Important works on the Bowen Basin sediments beneath the Surat Basin are Traves (1966, 1971), Swindon (1968), and Paten & Groves (1974) discussing the Permian sequence on the Roma Shelf; Benstead (1976) describing individual hydrocarbon fields; Exon (1976) describing the Permian sequence and presenting structure contour maps for the top of the Blackwater Group and for basement and isopach maps of the Blackwater Group and the Back Creek Group; and Thomas & others (1982) presenting recent seismic and source rock data of the Bowen Basin sediments in the selected area and overlying Surat Basin.

Structural Elements

Plate 2 shows the major structural elements of the Bowen Basin after Exon (1976). The main part of the Bowen Basin beneath the Surat Basin is the north–south trending Taroom Trough which reaches its deepest point at about latitude 25°S. Exon (1976) estimated 10 000 m of sediment. The basin shallows to the south so that, at about latitude 28°S, only about 600 m of sediment are present. The Taroom Trough is bounded on its eastern side by faults of the Mooki Fault system, known as the

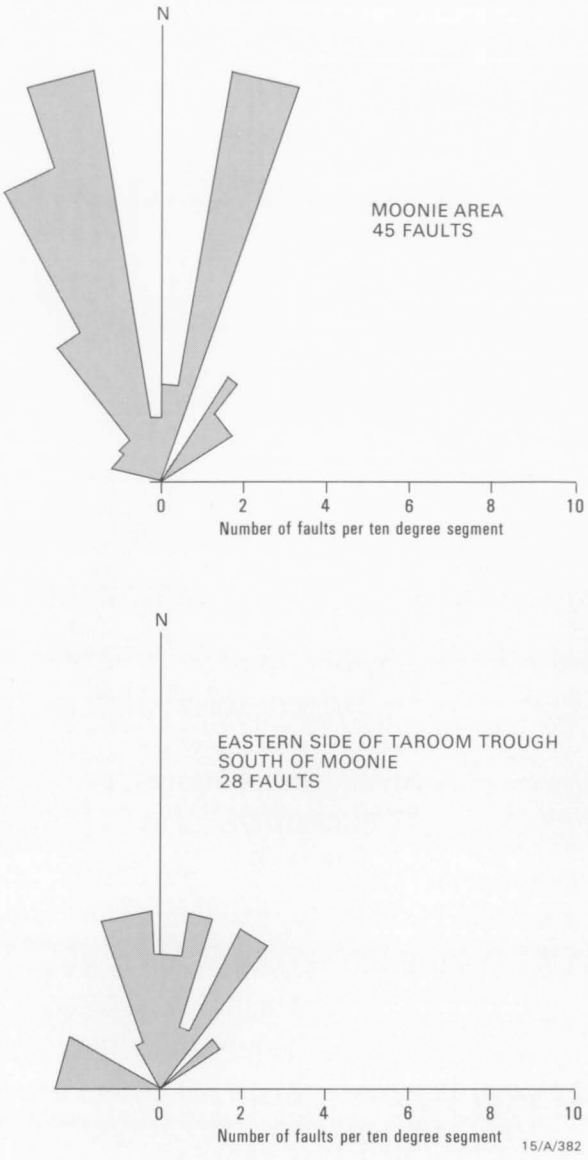

Fig. 8–1. Rose diagram of fault orientations, Goondiwindi and Burunga Fault zones.

Goondiwindi and Burunga Faults. These structures consist of major vertical or east-dipping reverse faults with large displacements (Thomas & others, 1982) and subsidiary faults which are either reverse or normal and strike at angles between 0 and 90° to the major faults (Fig. 8–1). The southern end of the Taroom Trough has several fault blocks. Plate 16 shows an east–west cross-section along latitude 28°30'26"S constructed from seismic data by Kahanoff (1963). At this point, the basin is bounded by several reverse faults on the eastern side, one of which is the Goondiwindi Fault, with a number of normal faults. This fault-bounded trough deepens to the north, but does not widen greatly (Thomas & others, 1982).

A northeasterly trending graben intersects the eastern side of the Taroom Trough at Moonie (Plate 2), producing a complex pattern of intersecting faults. This graben is possibly an extension of

the Mulgildie Rift which crops out farther to the northeast (Power & Devine, 1970).

The St. George–Bollon Slope and the Roma Shelf bound the Taroom Trough on its western side (Plate 2), forming a broad area of relatively shallow basement which slopes gently northeast. Permian and Triassic sediments wedge out between this basement slope and the overlying Surat Basin. Successive units overlap underlying sediments. Several large palaeo-valleys filled with Permian sediment extend onto the Roma Shelf (Plate 2).

Two major fault systems cross the Roma Shelf. The first, the Hutton–Wallumbilla Fault, is a north-northwesterly trending structure with a westerly downthrow of up to 800 m (Exon, 1976). Permian sediments are absent from parts of the upthrown side. The second, the Merivale–Arbroath Fault system, forms the western boundary of the Roma Shelf and was important in the development of the Denison Trough farther north (Bauer & Dixon, 1981). The Merivale Fault has a maximum westerly downthrow of greater than 1000 m and the Arbroath Fault about 1200 m of westerly downthrow, forming a half-graben with Permian sediments, termed the Arbroath Trough (Exon, 1976). These faults have a complex history; using seismic information, Bauer & Nelson (1980) and Bauer & Dixon (1981) argue that, in the Denison Trough, the Merivale Fault started as a normal fault in the Early Permian, but changed to a reverse fault during the Middle to Late Triassic.

Stratigraphy

Basement

The western side of the basin is underlain by Devonian metasediments, known as the Timbury Hills Formation, and by Carboniferous granites (Exon, 1976). The eastern part is underlain by felsic volcanics and sediments of Carboniferous to Early Permian age, called the "Kuttung Formation" in some company reports. These rocks were intruded by granites soon after deposition (Exon, 1976). The Camboon Andesite is also present beneath the northeastern part of this part of the Bowen Basin.

Permian

Reids Dome beds

Age. The Reids Dome beds contain Stage 3 and Stage 4 microfloras indicating an Early Permian age (Kemp & others, 1977).

Lithology. The Reids Dome beds consist of sandstones, conglomerates, siltstones, shales and coals.

Thickness. The Reids Dome beds reach a maximum thickness of 1121 m in the Arbroath Trough and 878 m in the Taroom Trough.

Distribution. In this part of the Bowen Basin, the Reids Dome beds are confined to the Arbroath Trough and to fault blocks along the eastern edge of the southern end of the Taroom Trough (Plate 5). Also, coal-bearing sediments resting on andesite at the bottom of UKA Burunga-1 are probably equivalents of the Reids Dome beds (Fig. 8–2).

Contacts. The Reids Dome beds rest unconformably on the basement in both the Arbroath Trough and the southern end of the Taroom Trough, whereas in UKA Burunga-1, they rest on andesitic flows and tuffs of the Camboon Andesite. In the Arbroath Trough, Jurassic Surat Basin sediments unconformably overlie the Reids Dome beds; in the southern part of the Taroom Trough, they are unconformably overlain by Triassic Rewan Group sediments; and in UKA Burunga-1, Blenheim Subgroup sediments rest on the Reids Dome beds (Fig. 8–2).

Depositional environments. The Reids Dome beds were formed as fluvial sediments with conglomerates and sandstones in channel belts, and the mudstones and coals on floodplains (McClung, 1981).

Palaeogeography and tectonics. The restricted distribution of the Reids Dome beds in this part of the Bowen Basin suggests that they were deposited in several separate troughs that subsided early in the Permian. The trough at the southern end of the Taroom Trough was sliced into fault blocks by reverse movements on the Goondiwindi Fault during the Triassic (Plate 16).

Undifferentiated Back Creek Group

Age. These sediments are probably equivalent to parts of the Blenheim Subgroup and are, therefore, Late Permian in age (Plate 3).

Lithology. The deposits are mostly grey mudstones with minor sandstones and limestones. Fragments of shelly fossils are present in cuttings from many holes which intersect these sediments.

Thickness. They reach maximum thickness of 809 m in UKA Burunga-1 (Fig. 8–2).

Distribution. The mudstones, sandstones and limestones wedge out against basement towards the southern end of the Taroom Trough and against the St. George/Bollon Slope and Roma Shelf to the west. On the western side of the Taroom Trough, they probably interfinger with the Muggleton and Tinowon Formations (Fig. 8–3) and to the north of latitude 26°S, the lithologies change so that the Back Creek Group can be subdivided. Small outliers of these sediments are

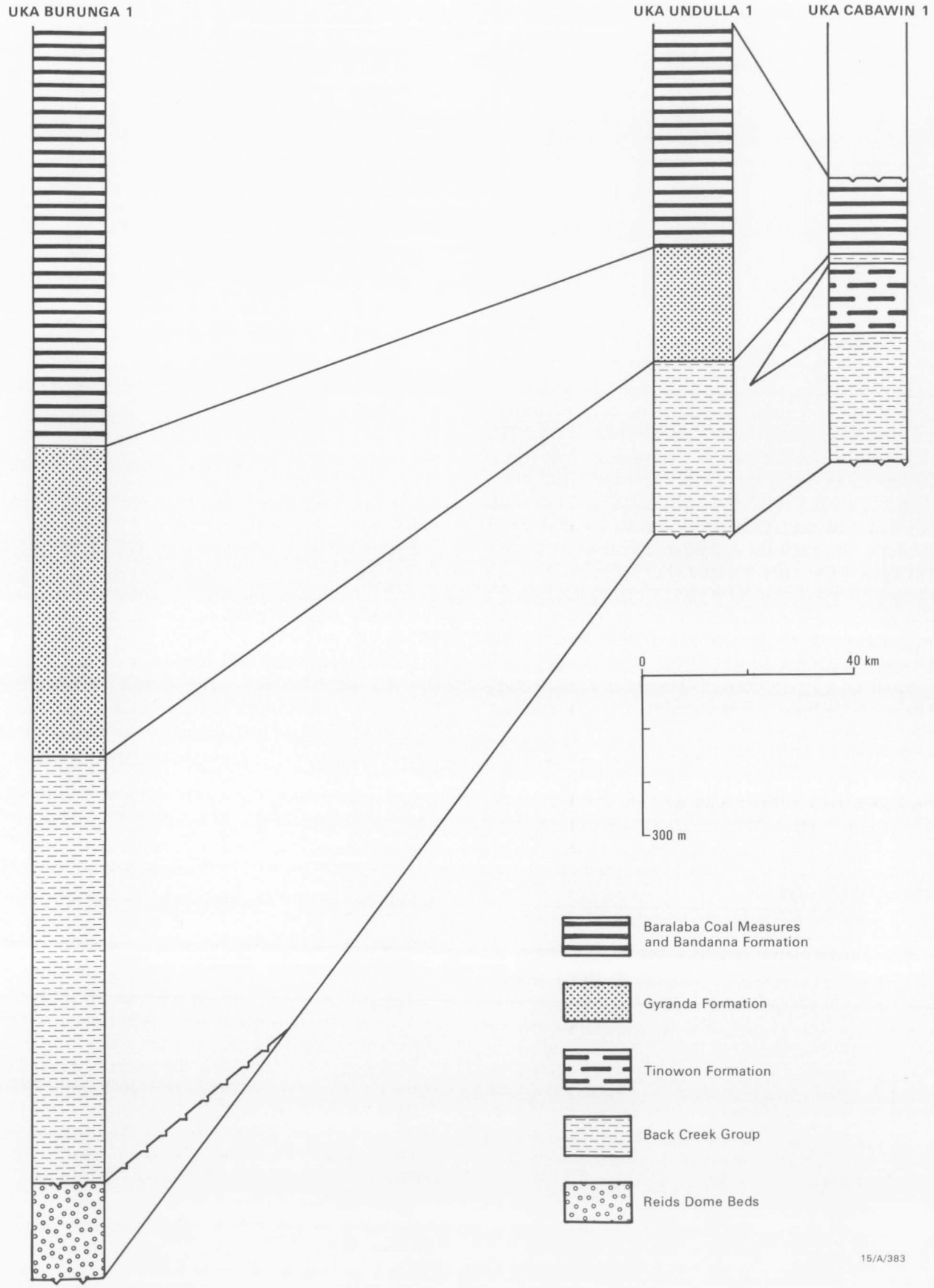

Fig. 8–2. Correlation of well sections on the eastern side of the Taroom Trough.

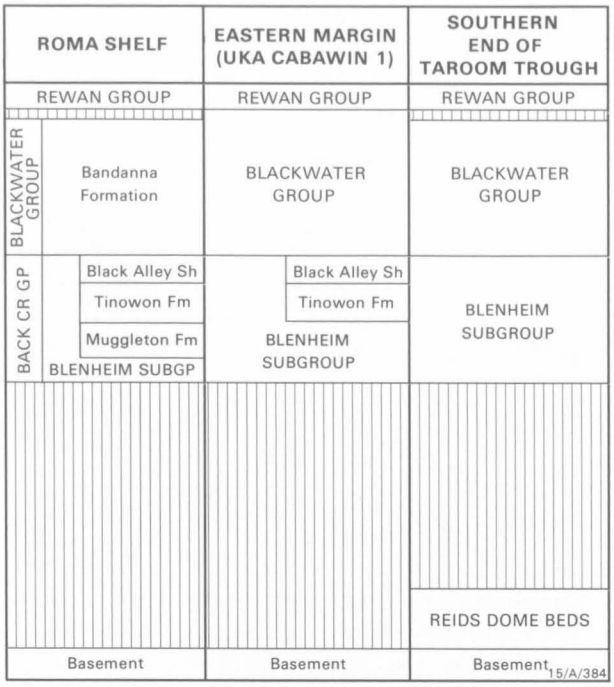

Fig. 8–3. Stratigraphic table for the southern part of the Bowen Basin.

present east of the Mooki Fault system in the Moonie area (Plate 2).

Contacts. The sediments unconformably overlie basement in most holes and the Reids Dome beds in UKA Burunga-1 (Fig. 8–3).

Depositional environments. The presence of marine fossils, particularly brachiopod shells, indicates marine environments and the fine grain size suggests accumulation in quiet water. In some wells, the number and thickness of sandstone beds increases vertically so that the unit grades into the overlying coal measures of the Blackwater Group. This suggest a prodelta setting or off-shore from a prograding coastline.

Palaeogeography and tectonics. The pattern of onlap indicates that this part of the Bowen Basin subsided more rapidly in the north than in the south (Fig. 8.2). Deposition took place east of what is now the eastern boundary of the Taroom Trough, but most of the sediments there were eroded after movement on the boundary faults, leaving a few outliers.

Correlations. The sediments are probably equivalent to the Blenheim Subgroup farther north and they interfinger with the Tinowon and Muggleton Formations on the Roma Shelf (Fig. 8–3).

Muggleton Formation

Age. The Muggleton Formation is Late Permian in age, with an Upper Stage 5 microflora (Paten & Groves, 1974).

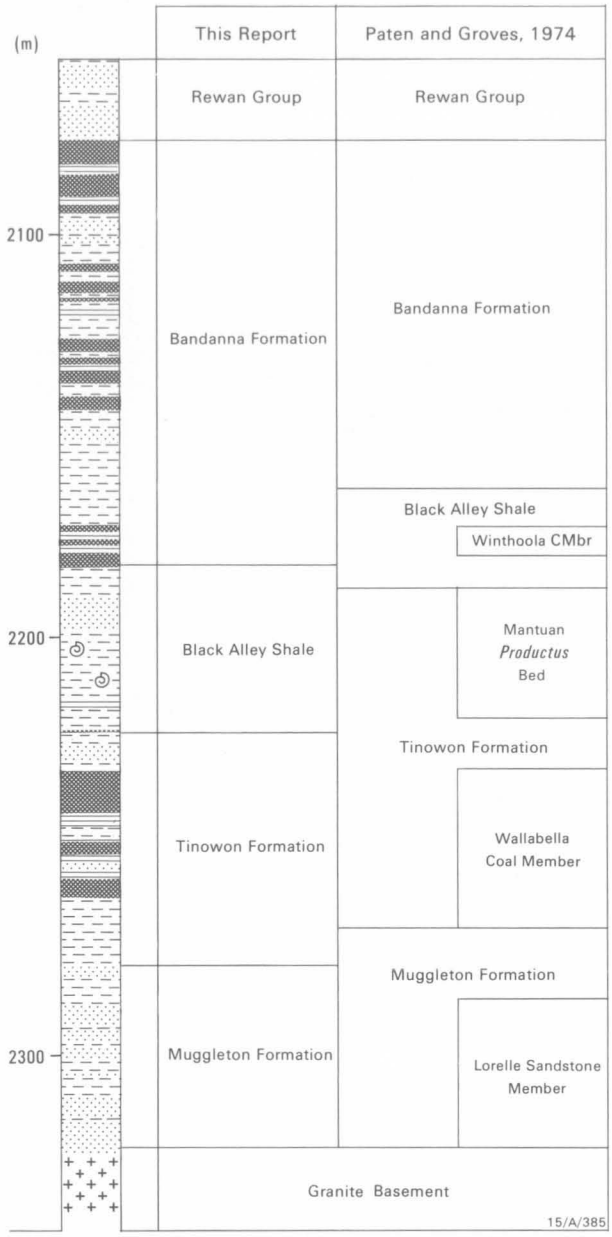

Fig. 8–4. Permian stratigraphy of the Roma Shelf (AAR-Apple Tree-1).

Lithology. The Muggleton Formation consists of fine to coarse sandstone and lesser amounts of siltstone and shale. Shell fragments are present in some holes. In this report, the term Muggleton Formation is restricted to predominantly sandy sediments, whereas Paten & Groves (1974) include some fine-grained sediments classed here as Tinowon Formation or undifferentiated Back Creek Group sediments (Fig. 8–4).

Thickness. The maximum thickness reached by the Muggleton Formation is 62 m (Paten & Groaves, 1974).

Distribution. The Muggleton Formation, as used in this report, forms tongues of sandy sediment which flank the bedrock slope on the western side of the basin (Fig. 8–5). These tongues grade eastwards into finer-grained Back Creek Group sediments.

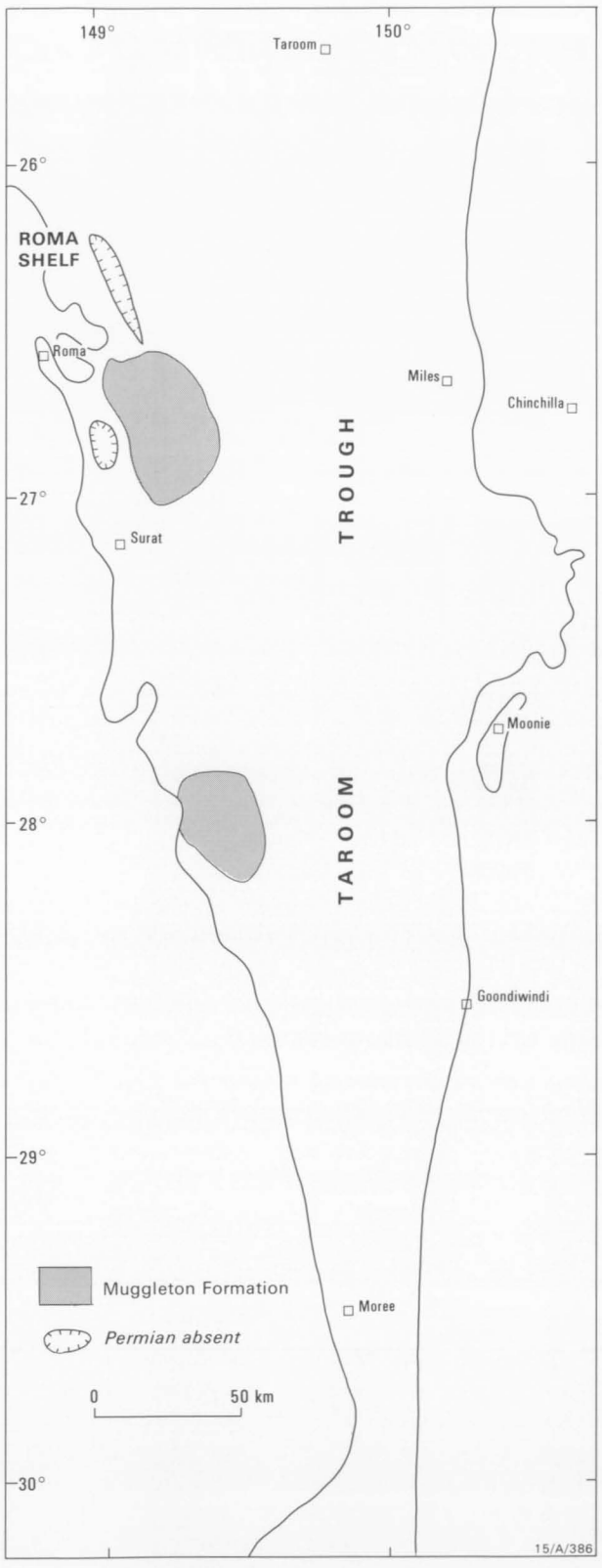

Fig. 8–5. Distribution of the Muggleton Formation.

Contacts. The Muggleton Formation conformably overlies Back Creek Group mudstones in some wells but in most, it unconformably overlies basement (Fig. 8–4).

Depositional environments. The Muggleton Formation consists of sandstones and mudstones deposited in a shallow marine environment.

Palaeogeography and tectonics. The sandy sediments of the Muggleton Formation accumulated near the western seashore of the Taroom Trough.

Correlations. The Muggleton Formation is part of the Blenheim Subgroup and is equivalent to finer-grained Back Creek Group sediments farther east, more remote from the Permian shoreline (Fig. 8–3).

Tinowon Formation

Age. The Tinowon Formation contains an Upper Stage 5 microflora and is therefore Late Permian in age.

Lithology. This formation consists of shale and siltstone with subordinate sandstone, and thin coal and tuff beds (Fig. 8–4). Some beds have shelly fossils.

Thickness. The Tinowon Formation reaches a maximum thickness of 122 m in UKA Cabawin-1.

Distribution. The formation is present on the western side of the Taroom Trough, flanking the Roma Shelf, and also occurs on the eastern side of the trough in UKA Cabawin-1. Between these two areas, the Tinowon Formation may form a continuous belt or, more likely, it may pass into marine sediments (Fig. 8–6).

Contacts. This formation rests conformably on the Muggleton Formation (Fig. 8–4) or on undifferentiated Back Creek Group sediments (Fig. 8–3).

Depositional environments. The Tinowon Formation was deposited as tongues of deltaic or coastal swamp facies.

Palaeogeography and tectonics. The formation represents a regressive phase of sedimentation on the edge of the Taroom Trough.

Correlations. The Tinowon Formation is probably equivalent to parts of the Peawaddy Formation of the Denison Trough (Paten & Groves, 1974; Plate 3, this report).

Black Alley Shale

Age. The Black Alley Shale contains an Upper Stage 5 microflora and is therefore of Late Permian age.

Lithology. This shale consists of tuffaceous shale and siltstone, with shell fragments in some wells (Fig. 8–4).

Thickness. The shale on the Roma Shelf is up to 50 m thick and thins to the west onto the shelf.

Distribution. In this part of the Bowen Basin, the Black Alley Shale can be recognised on the Roma Shelf and in UKA Cabawin-1 on the eastern side of the Taroom Trough (Fig. 8–2). It is absent

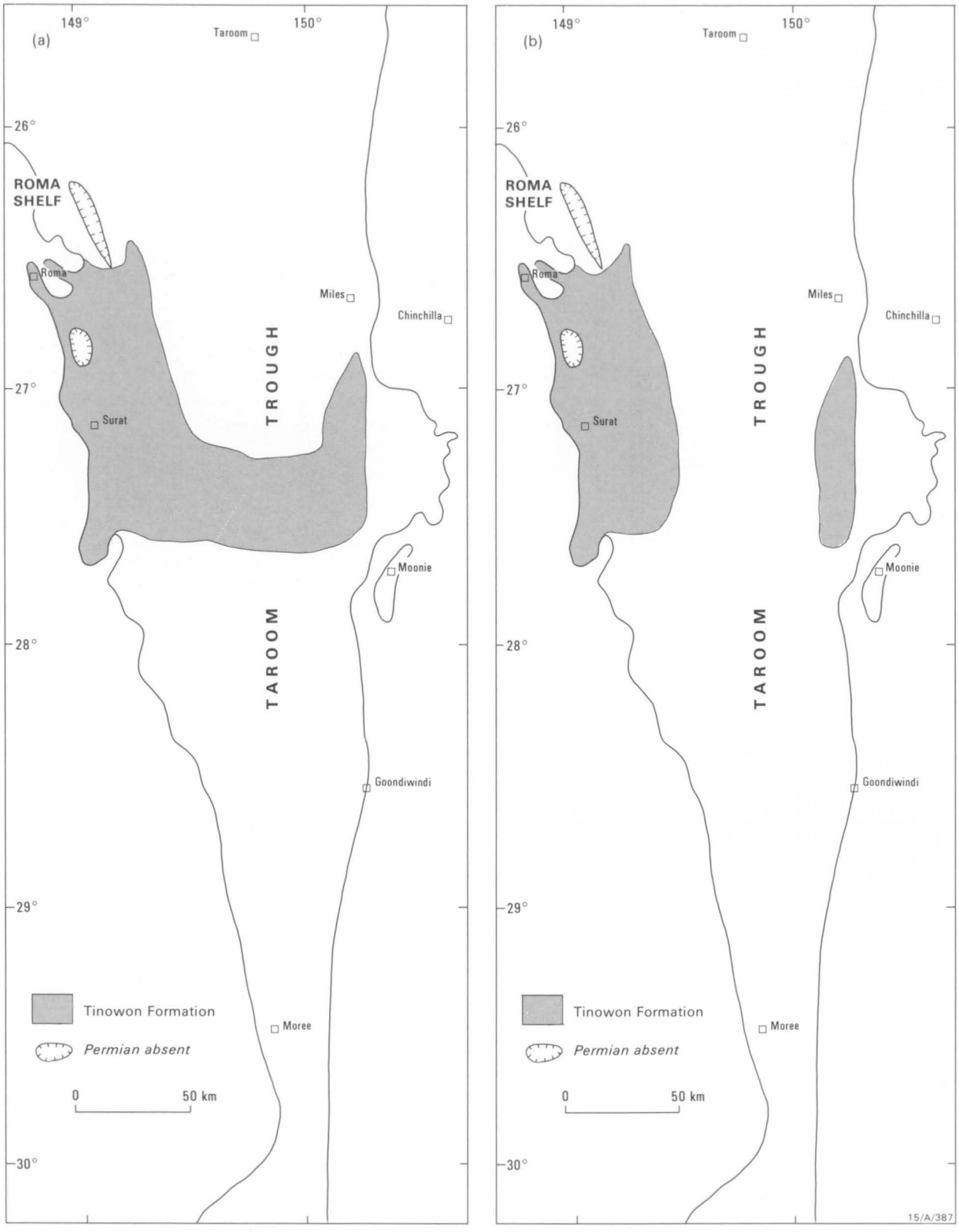

Fig. 8–6. Possible distributions of the Tinowon Formation — two alternative interpretations.

from the southern part of the Taroom Trough (Fig. 8–3).

Contacts. The Black Alley Shale conformably overlies the Tinowon Formation (Fig. 8–4).

Depositional environments. This shale formed during a marine incursion into the coastal environment in which the Tinowon Formation accumulated.

Palaeogeography and tectonics. This part of the Black Alley Shale represents a short period of high sea level, which produced a marine transgression onto the slowly subsiding basin margins.

Correlations. The high stand of sea level that resulted in deposition of the Black Alley Shale also formed the MacMillan Formation on the Comet Platform (Brakel, Chapter 17, and Brakel, 1983; Plate 3).

Blackwater Group (including Bandanna Formation)

Age. The Blackwater Group is of Late Permian age.

Lithology. This group consists of siltstone, shale and sandstone with numerous coal seams (Fig. 8–4), which comprise up to 37% of some well sections through the Blackwater Group. The shales, siltstones and sandstones are commonly tuffaceous.

Thickness. This group reaches a maximum thickness of 1374 m in well sections, but may be thicker in the deepest parts of the Taroom Trough.

Distribution. The group is thickest along the eastern side of the Taroom Trough, where it can be divided into the Baralaba Coal Measures and the Gyranda Formation (Fig. 8–2). It thins to the south and west. On the western edge of the basin, the Blackwater Group overlaps older units and has been removed from the upthrown side of the Hutton–Wallumbilla Fault. In the southern end of the Taroom Trough, the group has been erosionally removed off some fault blocks on the eastern side of the basin, but is preserved in the central part (Plate 16).

Contacts. The Blackwater Group conformably overlies Back Creek Group sediments (Fig. 8–3), except where it overlaps the older units onto basement. For example, in HEP Monclova-1, Blackwater Group sediments conformably overlie weathered basement. In some wells, the change from marine mudstones of the Back Creek Group to coal measures is gradual with a progressive increase in the number and thickness of sandstone beds (e.g., UKA Minima-1). The Blackwater Group is overlain conformably by the Triassic Rewan Group in the deeper parts of the basin, but on the Roma Shelf, the contact is unconformable (Paten & Groves, 1974; Fig. 8–3, present chapter).

Environments. The Blackwater Group in this part of the Bowen Basin displays features suggesting deposition in deltaic and fluvial environments. In some wells, the boundary between the Blackwater Group and the Back Creek is gradational with gradual increases in the number and thickness of sandstone beds. Such coarsening-up sequences suggest progradation of deltas across the area (Davies, 1980). Other wells display S.P. log patterns which indicate fining-up fluvial channel deposits in the Blackwater Group. Therefore, the Blackwater Group probably represents a lower delta plain in which peat accumulated in overbank settings (Horne & others, 1978).

Palaeogeography and tectonics. During deposition of the Blackwater Group, the southern half of the Taroom Trough subsided in much the same way as before, with maximum subsidence in the area near what is now the eastern trough boundary about latitude 26°S.

Correlations. The Blackwater Group includes the Bandanna Formation, on the Roma Shelf, and the Baralaba Coal Measures and the Gyranda Formation in the northeastern part of the area.

Structure Contours

Four structure contour maps include contours on horizons in the Bowen Basin beneath the Surat Basin. The widely spaced control points necessitated the use of seismic data for large areas of the basin (Exon, 1976). For the southern-most part of the Taroom Trough, poor data quality prevents the drawing of structure contours; hence, form lines are used to delineate dome and basin structures.

Plates 4 and 5 present structure contours on the bottom and top of the Reids Dome beds. The two small areas of subcrop are the Arbroath Trough, which is a half-graben and the fault blocks on the eastern side of the southern end of the basin. The contours in these fault blocks show slight doming of the Reids Dome beds, probably caused by faulting.

Plates 9 and 10 depict structure contours on the top and bottom of the Blackwater Group, showing that this part of the Bowen Basin has a fairly simple structure with the deepest part of the basin along the axis of the Taroom Trough between latitudes 26° and 27°S. From there it shallows gradually towards the west and south. The structure is more complex along the eastern edge and in the southern end of the basin. A number of large folds are present along the eastern edge of the basin about latitude 26°S where the faults forming the eastern basin boundary are more complex than farther south, suggesting that the folds result from movements on these faults. Complex fault patterns are also responsible for the northeasterly trending graben at Moonie and for the structure of the southern end of the Taroom Trough. On the western side of the basin, the structure contours follow basement topography. This is particularly noticeable where the Permian valleys cut into the Roma Shelf. The only fault, which noticeably affects the structure of the Blackwater Group on this side of the basin, is the Hutton–Wallumbilla Fault.

Isopach Maps

Isopachs of the Blackwater Group are shown on Plate 12. They indicate that the Coal Measures are thin on both the western side and in the southern

end of the basin and that thicknesses increase rapidly to the east. This pattern is based on the seismic sections published by Thomas & others (1982) which shows the Permian sequence thickening to the east, where it is truncated abruptly by the eastern boundary faults. This isopach pattern indicates that subsidence was rapid along what is now the eastern edge of the Taroom Trough north of latitude 28°S, and that the basin floor tilted towards the northeast as it sank, so that sediments lap onto the western and southern parts of the basin. Relatively slow subsidence on the western side also resulted in some erosion of the Permian sediments before the Triassic Rewan Group was deposited on this side of the basin (Paten & Groaves, 1974; Exon, 1976).

Permian Coal Beneath the Surat Basin

Coal is present in three units: the Reids Dome beds, the Tinowon Formation, and the Blackwater Group. The Reids Dome beds contain thin coal seams throughout the well sections examined, but coal is present only in small proportions. However, the Tinowon Formation and the Blackwater Group has significant amounts of coal; sections with 10% or more of coal are common as are seams greater than 1 m thick. In several wells, the Blackwater Group is between 30 and 40% coal. The biased distribution of control points prevents any meaningful comparison between the proportion of coal in the deeper with the shallow parts of the basin; therefore, the role of subsidence rates in controlling coal distribution cannot be deduced (cf. Cooper Basin, Chapter 11).

Though the Permian coals cannot be mined with existing techniques, they are important as hydrocarbon source rocks. Shibaoka & others (1973), Thomas & others (1982) and Middleton (Chapter 25) have pointed out that these coals have high enough levels of organic maturity to generate oil and gas, and Thomas & others (1982) showed that hydrocarbons in the overlying Surat Basin were generated in Permian sediments. This, taken with the findings of Thomas & others (1982) and Middleton (Chapter 25) demonstrates that most potential structural and stratigraphic traps were in place before the coals reached their present level of maturity, and suggests that the Bowen Basin beneath the Surat Basin must be considered prospective for hydrocarbons.

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CHAPTER 9

Calen Basin

by
A.T. Brakel

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Introduction

The Calen Basin is defined here as the depositional entity containing the Permian sequence above the unconformity at the base of the Calen Coal Measures. The basin now occurs as two outcrop areas northwest of Mackay, Queensland (Fig. 9–1). Previously, the sequence has been variably assigned to the Yarrol Basin (Laing & Hill, 1960), the Midgeton Block (Clarke & others, 1971), and the Camboon Volcanic Arc of the Yarrol Orogen (Murray, 1983).

On its northwest, the Calen Basin is faulted partly against the Urannah Igneous Complex of the Connors Arch, which separates the coal measures from the Bowen Basin, and partly against the Carmila beds. Elsewhere, the basin boundaries are largely erosional, so that the underlying and surrounding Early Permian rocks of the Lizzie Creek Volcanics, and the freshwater and volcanogenic Carmila beds are exposed. Farther east, along the coast, is the Devonian to Carboniferous Campwyn Block. The coal measures are intruded by sills, dykes, plugs and stocks of Permian to Cretaceous dolerite, rhyolite and granite.

The Calen Basin rocks generally form a subdued topography of low strike ridges in relatively flat terrain, but near Mt. Toby there are high, steep-sided hills.

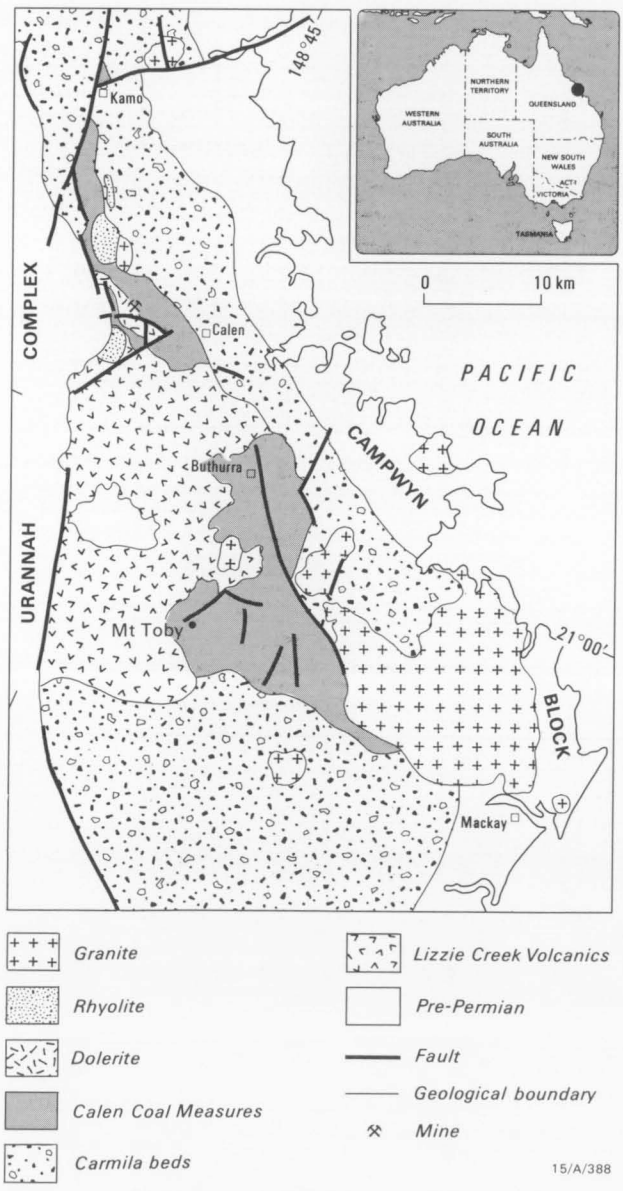

Fig. 9–1. Geological map of the Calen Basin and surroundings.

Stratigraphy

Although coal has been known in the district since the 19th century, the enclosing sequence was first named the Calen Coal Measures by Laing & Hill (1960). There are no formally named members.

Lithology

The unit consists of up to 300 m of cross-stratified coarse quartz sandstone, thin pebble conglomerate, sandstone/siltstone laminite, siltstone, claystone, carbonaceous shale, and coal. It lacks the tuffaceous and epiclastic volcanic detritus of the underlying Carmila beds. The best surface exposures of sandstone, siltstone, and intruded sills and dykes are in Bruce Highway cuttings in the southern area (Jensen & others, 1966). Two GSQ drillholes (Hillalong NS5 and 6) intersected similar lithologies, as well as coarse lithic–labile arenite, burrowed shale, and arenite with flaser bedding. Many of the arenites contain intraclasts of shale (Koppe, 1974).

Stratigraphic Relations

The top of the Calen Coal Measures is truncated by the present-day erosional ground surface. The base is variously the Lizzie Creek Volcanics or the Carmila beds. The base of an upper quartz arenite marker ranges from 60 to 300 m stratigraphically above the base of the coal measures, suggesting overlap on older units. Divergences of strike with the Carmila beds also suggest an unconformity; and an unconformity with the Lizzie Creek Volcanics is known near Butharra (Jensen & others, 1966; Clarke & others, 1971).

Age and Correlation

Glossopteris and *Vertebraria* demonstrate a Permian age for the unit, and it post-dates the thick sequence of unconformably underlying lower Permian rocks. Reid (1929) correlated the coal measures, on lithological grounds, with what is now the Gebbie Subgroup, and later workers have accepted this as reasonable in the absence of any contrary evidence.

Environment and Palaeogeography

Dickins & Malone (1973) described the palaeoenvironment as "largely fluviatile, but ... partly laid down in lakes and local swamps." The subsequent GSQ drilling has allowed more detailed interpretations, including recognition of high and low-energy fluvial channel, floodplain and channelled swamp sub-environments (Koppe, 1974). Beds with both burrowing and flaser bedding record tidal activity intermittently throughout the sequence. Thick quartz arenite units (at least one of which has a sheet-like geometry) suggest braided stream deposition, whereas thinner lithic-labile arenites appear to occur within fining-upward cycles of point bar deposits. The composition of the latter sandstone may record the addition of substantial amounts of air-fall tuff to the system. The overall impression is that of dominantly lower delta plain environments interrupted by upper delta plain to fluvial braided stream episodes. This reflects a sedimentation balance which usually kept the region just above sea level. When subsidence outpaced sedimentary buildup (due to tectonism, or compaction following delta-lobe abandonment), the sea advanced and tidal influence dominated. There may also have been periodic uplifts in the hinterland, causing braided sheet wash to invade normally deltaic areas.

Structure

The Calen Basin and underlying Permian occupy a northwesterly trending trough, possibly a graben, between blocks of older rocks. At least some of the relative uplift on the Connors Arch is post-Permian.

The coal measures have been folded into a broad northwesterly trending syncline in which dips are generally 20° or less. Locally, dips range to near vertical as a result of minor folding, faulting and pushing-aside of rocks by intrusions. Structural deformation is greatest in the north, where the Calen Coal Measures have been downthrown and tilted to vertical along the faulted western margin of the basin. The southern area is structurally simpler with lower dips, although some block faulting has occurred.

Igneous Intrusions

Three types of intrusives have been emplaced in the Calen Coal Measures. In the northern area there are two large plugs of rhyolite, one of which has been invaded in turn by a granite stock. There is also a microgranite sill and a large porphyritic dolerite body (Clarke & others, 1971). These intrusions have disturbed the surrounding bedding and coked some coal seams. To the south, dykes and sills are numerous. They can be seen in road cuts, and form almost one third of the section encountered by GSQ Hillalong NS 5. Parts of the sedimentary sequence have been extensively indurated by the intrusives, while coal was locally metamorphosed to anthracite rank, coked, or even obliterated (Koppe, 1974).

The age of the igneous bodies is not known, and can range from Late Permian to Cretaceous. Isotopic dates from post-Early Permian felsic intrusives elsewhere in the region show that there was some magmatic activity in the Late Permian, but that most of the bodies were emplaced during the Early Cretaceous (Jensen & others, 1966).

Coal Deposits

Coal in the basin was noted by Jack (1887), and in the next half century was also reported on by Maitland (1889), Ball (1910), Saint-Smith (1920), and Reid (1924, 1929). Mining has been restricted to the area 6 km west of Calen by two short-lived collieries which exploited a 2.6 m-thick seam dipping at 50°. Small tonnages of high-rank low-volatile thermal coal were produced by Calen Colliery between 1927–28 and by Fleetwood Colliery between 1932–39 (Clarke & others, 1971; Koppe, 1975). Even though the coal was of good quality, production ceased because of the prohibitively steep dip. Other surface appraisals and shallow shafts have been discouraging due to extensive folding, faulting, coking by intrusives, and the thinness of the seams. The drilling by the Geological Survey of Queensland in the less-disturbed southern area failed to find seams comparable in quality or thickness to the seam mined near Calen. The intensity of igneous intrusion was so

great, and the structural dislocation in many areas so extensive, that there is little likelihood of the preservation of economically viable coal.

Mention should also be made of some small coal occurrences in the underlying freshwater Carmila beds. These all occur well to the south of the Calen Basin. Coal seams, none thicker than 1 m, are exposed in Black Waterhold Creek, 22 km south-west of Mackay, and there are reports of coal in the Koota district, 23 km south-southeast of Sarina, and at Oakey Creek, 22 km north of St Lawrence (Jensen & others, 1966). The chances of any deposits being large enough to support a mining venture are, however, very slim indeed.

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CHAPTER 10

Stratigraphy and Permian Coal Measures of the Galilee Basin, Queensland

by
A.T. Wells

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Introduction

Most of the sequence of the Galilee Basin, which comprises Late Carboniferous, Early and Late Permian, and Early and Middle Triassic sediments, is obscured beneath the Jurassic and Cretaceous deposits of the Eromanga Basin sequence. Hence, information on the basin coal measures was obtained primarily from an examination of deep petroleum exploration well sequences, exploratory coal drilling, and some of the deeper water bores. Only well completion reports subsidised under the Petroleum Search Subsidy Act were available for study but, as very few wells have been drilled since the cessation of subsidy, very little new information has become available. An invaluable guide to the subsurface data in the northern Galilee Basin is provided in an unpublished Geological Survey of Queensland Record (Hawkins & Gray, 1981) supplemented by a comprehensive review of the Permian and Late Carboniferous palynostratigraphy of the Galilee Basin by Norvick (1974, 1981). Numerous other publications, chiefly of the Bureau of Mineral Resources, the Queensland Department of Mines, and Geological Survey of Queensland, were used to compile this report.

A study of each petroleum well completion report and composite log was made and, where necessary, the large-scale electric logs were perused in parts of the sequence where the formation boundary was difficult to ascertain. The author-preferred determinations of formation boundaries were compiled together with interval thicknesses and sub-sea depths. Intervals in the coal-bearing sequences were subdivided into formations in the coal-bearing Permian sequences. Other data tabulated included criteria for the selection of the Permian coal measure boundaries, palynological determinations, lithology, coal descriptions, thicknesses and percentage, structure, and environmental indicators. The 1:1 000 000 data sheets, with formation thicknesses and sub-sea depths were generated by computer from the data base and were used to construct isopach and structure contour maps and to compile other syntheses for this report.

Stratigraphy

Introduction

The generalised stratigraphic succession in the Galilee Basin is shown in Table 10–1 and their relationships to Permian units in other eastern Australian basins in Figs 10–1 and 10–2. The stratigraphy conforms with the nomenclature of Gray & Swarbrick (1975). The table also lists the

TABLE 10–1. GENERALISED STRATIGRAPHY OF THE GALILEE BASIN

AGE	ROCK UNIT		RECORDED THICKNESS (m)	LITHOLOGY	ENVIRONMENT
TRIASSIC	WARANG SANDSTONE *	MOOLAYEMBER FORMATION	1230a	Mudstone, siltstone, minor sandstone	
		CLEMATIS SANDSTONE		Sandstone, minor mudstone and siltstone	FLUVIO-LACUSTRINE
		REWAN GROUP	194b	Mudstone, siltstone, sandstone	
LATE PERMIAN	BETTS CREEK BEDS *	BANDANNA FM CORRELATIVE	208a	Sandstone, siltstone, mudstone, coal	DELTA PLAIN
		COLINLEA SST CORRELATIVE	127b	Sandstone, conglomerate, coal	ALLUVIAL PLAIN
	DISCONFORMITY				
EARLY PERMIAN	JOE JOE GROUP	ARAMAC COAL MEASURES	100a 271b	Sandstone, siltstone, mudstone, coal	FLUVIAL
LATE CARBONIFEROUS		JOCHMUS FORMATION	70 – 755a 135 – 171c	Sandstone, siltstone, mudstone, tuff, conglomerate	COMPLEX FLUVIO-LACUSTRINE GLACIAL INFLUENCE
	BOONDEROO BEDS *	EDIE TUFF MEMBER	30 – 155a	Mudstone, siltstone, tuff, minor sandstone	LACUSTRINE WITH CONTEMPORANEOUS VOLCANISM
		JERICHO FORMATION	84 – 804a	Mudstone, siltstone, sandstone	COMPLEX FLUVIO-LACUSTRINE GLACIAL INFLUENCE
		OAKLEIGH SILTSTONE MEMBER	39 – 154a	Siltstone, mudstone, shale	CALM WATER LACUSTRINE GLACIAL INFLUENCE
		LAKE GALILEE SANDSTONE	44 – 263a	Sandstone, minor mudstone	FLUVIAL (BRAIDED)

15/A/618

Notes: a Thickness recorded in Koburra Trough – Maneroo Platform region
b Thickness recorded in Lovelle Depression
c Values for unnamed unit, Lovelle Depression
* Formal name applied to outcrop section

Thickness for Pre-Aramac Coal Measures formations after Jackson & others 1981; thickness of younger units by author

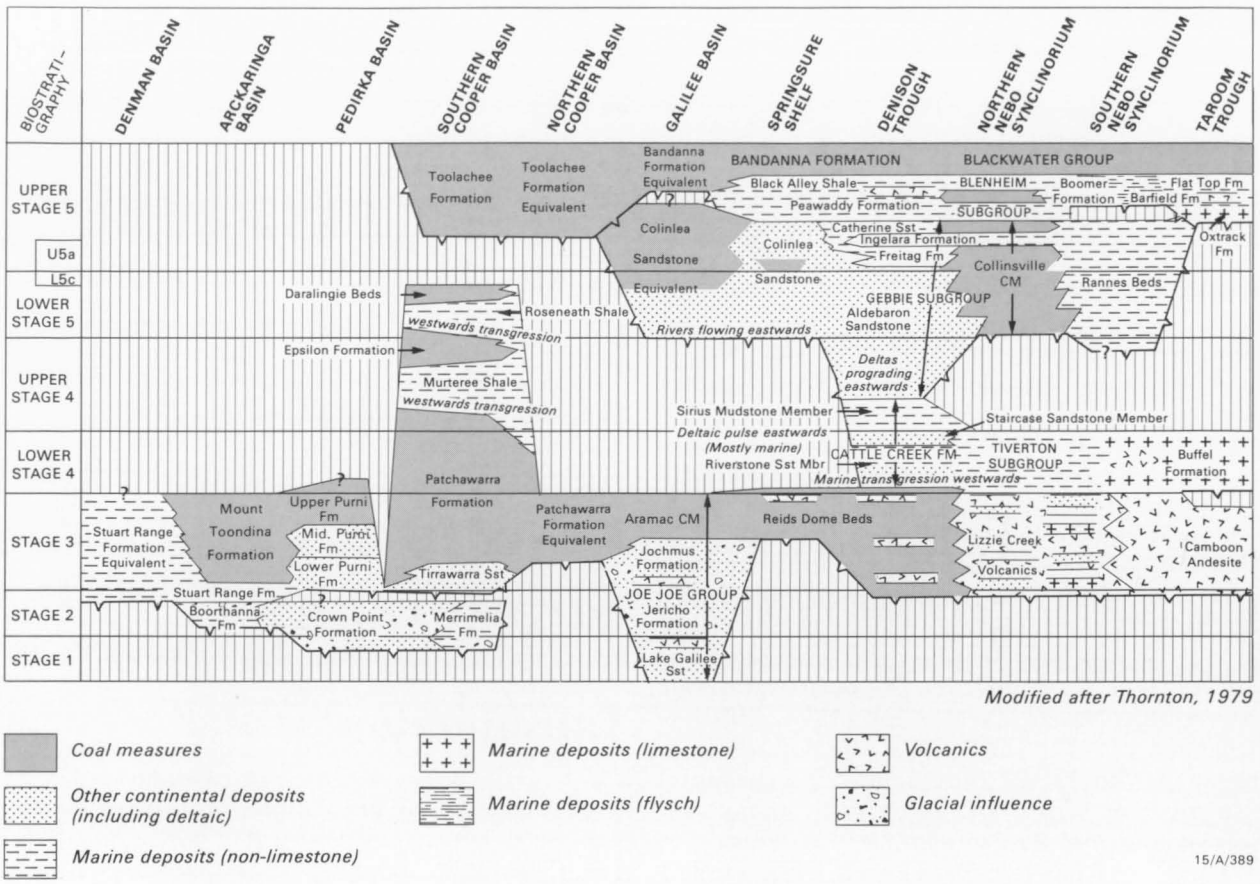


Fig. 10–1. Stratigraphic relationships between Permian formations in the Cooper, Galilee and Bowen Basins.

nomenclature proposed for the outcrops of the late Palaeozoic and early Mesozoic formations of the Galilee Basin. The definitions of these outcropping units were given originally in an unpublished record by Vine & others (1964). Their stratigraphic nomenclature was subsequently formalised by Mollan & others (1969) and Vine & Doutch (1972), and is discussed in the section on the stratigraphy of Galilee Basin outcrops.

The units defined in outcrop are not applicable to the sequences penetrated in the sub-surface as the latter are only related to those parts that were penetrated by petroleum exploration wells and deep stratigraphic drill holes. Hence, the nomenclature in this report is that proposed by Gray & Swarbrick (1975).

Subsequent regional reviews of the Galilee Basin geology include those by Milligan (1975), Vine (1976), Hawkins (1978), Evans (1980), and Jackson & others (1981). The regional geology is adequately covered by these publications, including diverse aspects of formations.

Descriptions of the outcrop geology of the Galilee Basin are covered by maps, reports, explanatory notes and bulletins issued chiefly by the Bureau of Mineral Resources (BMR). They include the explanatory notes of the following 1:250 000 geological Sheets:

Hughenden (Vine & Paine, 1974),
Charters Towers (Clarke & Paine, 1970),
Galilee (Vine & Doutch, 1972),
Jericho (Senior, D.A., 1973),
Tambo (Exon, 1970b), and
Springsure (Hill, 1957; Mollan, 1972).

BMR publications that include descriptions of the Galilee Basin sediments include Exon & others (1972), Mollan & others (1969), Senior & others (1978), and Exon (1976). Numerous geophysical surveys, chiefly seismic surveys, conducted on behalf of petroleum exploration companies over limited areas, are described in relevant well completion reports. In two areas, the Lovelle Depression and the Koburra Trough, the seismic traverses were of sufficient density to allow the compilation of structure contour and isopach maps. The review reports of Nelson (1977) and Pinchin (1978) describe the Koburra Trough, and Hawkins & Harrison (1978) carried out a similar study of the Lovelle Depression. Many of the structure contour maps in the present report rely on these reviews for contour control. Other BMR seismic surveys are reported by Harrison & Bauer (1975) and

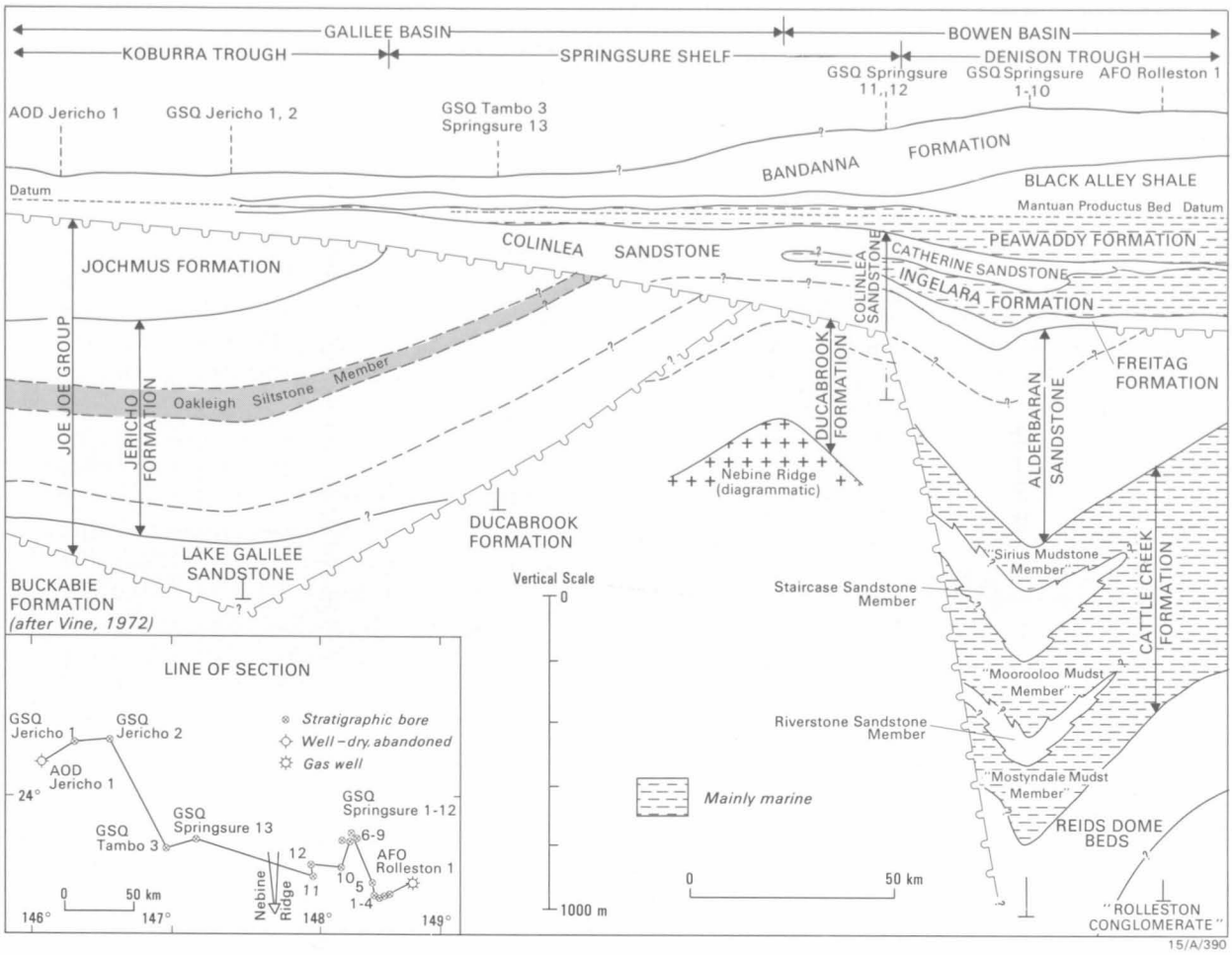


Fig. 10–2. Relationship of Late Paleozoic strata in the Bowen and Galilee Basins (after Grey, 1976).

Harrison & others (1975). The regional aeromagnetic survey over the basin is discussed by Hsu (1974).

In addition, various aspects of the basin geology, geophysics, and mineral exploration are covered by numerous journal papers, unpublished reports and records; these are referred to in appropriate parts of the text.

Outline of Stratigraphic Sequences

The sedimentary sequence in the Galilee Basin (Table 10–1) is of Late Carboniferous, Early and Late Permian, and Early and Middle Triassic age. A major hiatus is present between the Early and Late Permian formations, covering the whole of biostratigraphical Stage 4, lower Stage 5, and the lower part of upper Stage 5. The significance of this hiatus will be discussed below.

The formations of interest here are both the Early and Late Permian coal-bearing units. The principal Early Permian coal-bearing unit is the Aramac Coal Measures — the youngest unit in the Joe Joe Group. Some coal occurs in the underlying formations, but it is mostly thin and discontinuous.

Coal in the unconformably overlying Late Permian sequence is present in the Colinlea Sandstone and the younger Bandanna Formation, and their equivalents, but is almost completely absent in the intervening marine tongue comprising the Peawaddy Formation and the Black Alley Shale. The Triassic rocks at the top of the Galilee Basin sequence are, with rare exceptions, also barren of coal. Thus, emphasis in this discussion will be placed on the coal-bearing units in the basin, and other units will only be described briefly.

Most of the Permian deposits are of continental origin; the only exception is the Late Permian sequence on the Springsure Shelf, where marine sediments occur between the Colinlea Sandstone and Bandanna Formation. The extent of this marine incursion is unknown, but its approximate limits are established from widely spaced drill holes: the marine deposit is confined principally to the southern part of the Galilee Basin on the Sprinsure Shelf, but extends for a short distance into the basin.

The coal measure's palaeoenvironments are interpreted solely from the graphic logs of the sequences penetrated by about 70 stratigraphic

and petroleum exploration wells examined, together with descriptions of cores and cuttings from exploratory coal drilling. The distribution and sub-surface configuration of the coal-bearing sequences is illustrated by the enclosed structure contour and isopach maps, and accompanying cross-sections.

The Late Permian coal measures are the most widespread; but the Early Permian ones were apparently eroded from large areas prior to Late Permian deposition. However, the maximum thickness of the Early Permian coal measures, about 270 m preserved in the Lovelle Depression, is greater than that of the thickest Late Permian coal measures of about 200 m in the Koburra Trough.

Biostratigraphy

The sedimentary sequence in the Galilee Basin is almost entirely continental in origin so that dating methods mainly rely on palynology. The principal references of these studies of the Late Carboniferous, Permian and Triassic formations include data from well completion reports, and a review by Norvick (1974, 1981) of palynological results in the subsidised well-completion reports.

A summary of the Permian and Carboniferous palynostratigraphy of Australia by Kemp & others (1977) includes the Galilee Basin. The assemblages recognised by various workers in the Cooper, Galilee and Bowen Basins, and their correspondence with biostratigraphic units and their main palynological characteristics, is shown in Table 10–2, compiled by Kemp & others (1977). Stage 1 assemblages occur in the restricted deep parts of the basin in the thick coarse clastics of the Joe Joe Group, the equivalents of outcrops on the Springsure Shelf. Stage 2 assemblages occur across a slightly wider area within the basin, in dominantly coarse clastics which bear a minor glacial imprint. Norvick (1971, 1974) subdivided Stage 2, and referred the Boonderoo beds in outcrop at the northern edge of the basin to the upper part of Stage 2. Stage 3 assemblages are restricted to a small area in the western part of the basin to the Aramac Coal Measures that overlie the coarse clastic interval. The hiatus at the top of this interval is equivalent to all of Stage 4, and early Stage 5, and presumably these sediments were eroded before the later basin-wide coal measures were deposited. However, in Weston 1 well in the Lovelle Depression, a lower Stage 5 assemblage has been described by Price (unpublished data) indicating earlier deposition in a small area.

In GSQ Aramac 1 and Hexham 1, the Aramac Coal Measures have a Stage 3 assemblage (identified by the presence of *Verrucosisporites pseudoreticulatus*) and early Stage 3 assemblages persist downward into the upper part of the Jochmus Formation; and those referable to Stage 2 were recovered from the underlying Jericho Formation. A sequence in a somewhat older part of the Joe Joe Group was penetrated in Lake Galilee and is probably from the lower part of the Jericho Formation. The Stage 1 to Stage 2 transition occurs within the lower part of the Jericho Formation. Upper Stage 5 assemblages were encountered in the sequence above the Aramac Coal Measures which are referred to informally as correlatives of the Bandanna Formation and Colinlea Sandstone/Bandanna Formation equivalent (Hawkins & Gray, 1981). This assemblage is described by McKellar in the GSQ Hexham 1 and GSQ Aramac 1 bore holes. (The youngest Permian core from Aramac 1 yielded an assemblage identified with the *Protohaploxypinus reticulatus* assemblage.)

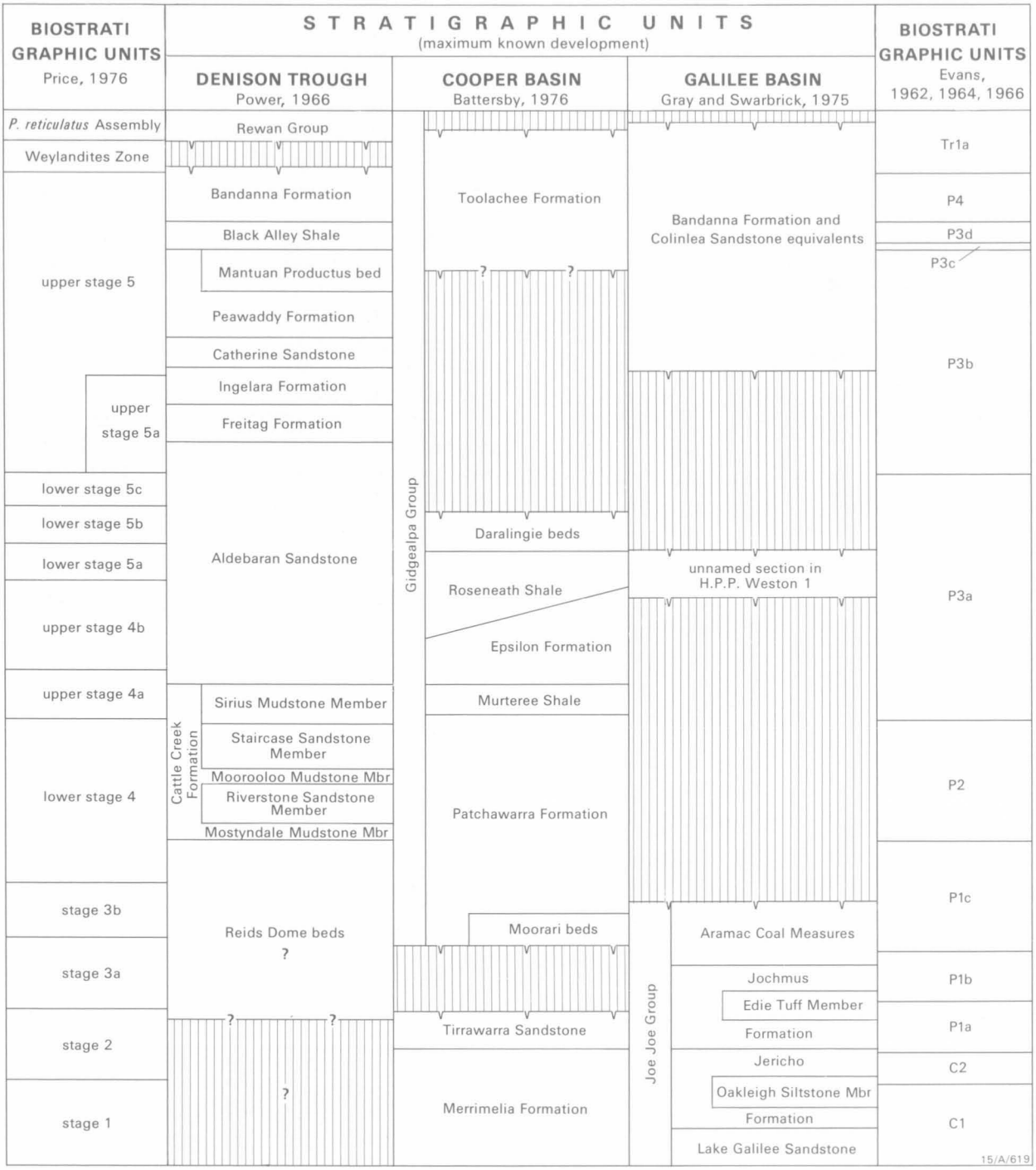
In eastern Australia, 16 palynostratigraphic units have been identified in the interval from the Tournaisian to the latest Permian. Stages 1 to 5, applied in eastern Australia by Evans (1967, 1969), were originally conceived as assemblage zones, but have been subsequently modified in terms of units similar to taxon range zones, which are largely defined on the first appearance of selected forms.

Palynological zones (assemblage and taxon-range) must be applied cautiously in regional stratigraphic syntheses. Local factors, such as phytogeographic controls, agents of sedimentation, and preservational differences may determine the presence or absence of the index species, and so limit their usefulness to a small area or particular sedimentary basin. However, many of the broad quantitative changes are apparently widespread and reflect a large-scale gross change in the composition and distribution of late Palaeozoic vegetation.

The identification of a boundary corresponding to the base of the Permian has remained problematical. Evans (1969) indicated that it is at the base of Stage 2, probably corresponding with the advent of the *Glossopteris* flora. By comparison, the earliest macrofossil remains of the *Glossopteris* flora in Australia are those in the Boonderoo beds (White, 1964), which have a late State 2 microfossil assemblage (Norvick, 1974). Helby (1969) suggested that the base of Stage 1 was an appropriate location of the top of the Carboniferous in Australia, and later he (Helby, Chairman's Address, Geological Society of Australia, NSW Division 1974) proposed that it approximates a level within the lower part of Stage 3. Powis (1982) has suggested that the boundary should be at this level or perhaps somewhat higher, as he has placed the boundary at the base of the Aramac Coal Measures.

Kemp & others (1977) concluded that the precise position of the Carboniferous–Permian boundary in Australia remains obscure, but suggested that Stage 2 is Carboniferous and the Carboniferous–Permian boundary approximates the Stage 2/Stage 3 boundary.

TABLE 10–2. EASTERN AUSTRALIAN PALYNOLOGICAL STAGES AND THEIR DISTRIBUTION IN LITHOSTRATIGRAPHIC UNITS OF THE BOWEN, COOPER AND GALILEE BASINS



Outcrop Distribution

With the exception of a narrow strip of outcrops along the northeastern and eastern margins of the Galilee Basin (Plate 1), the stratigraphic succession is obscured by Jurassic and Cretaceous sediments of the Eromanga Basin, and in places by thick Tertiary sediments.

Permian sediments, identified with both the Boonderoo beds and the Betts Creek beds, crop out intermittently from a position about 70 km northeast of Hughenden to the Mingobar Monocline in the southeast. Exposures of the Late Permian Colinlea Sandstone and Early Permian–Carboniferous Joe Joe Group first appear about 70 km north of Alpha, and together with the overlying Black Alley Shale and Peawaddy Formation, which

first crop out about 30 km south of Alpha, continue around the southern exposed margin of the Drummond Basin onto the Springsure Shelf where an almost continuous sequence of Galilee Basin Permian sediments is preserved.

Triassic rocks form an almost unbroken belt of outcrop along the northeastern and eastern basin margin. The first exposure of the Warang Sandstone coincides with the first occurrence of Permian sediments in the northeast. The transition of the Warang Sandstone to a fourfold division of the Triassic sequence takes place near Shuttleworth at the central eastern edge of the basin. The formations south of this point, from top to bottom, the Rewan Group, Dunda beds, Clematis Sandstone and Moolayember Formation, make up the Triassic interval. These units continue uninterrupted onto the Springsure Shelf and, as with the Permian sequence, a complete sequence is exposed here.

Outcrop Nomenclature–Eastern and Northeastern Galilee Basin

Vine & others (1964) defined the *Boonderoo beds*; a new name for a 'blue-grey to grey-green' mudstone, in part varved, with some lithic sandstone, sandy mudstone and rare tillite, which in the type section (latitude 20°18'S, longitude 144°30'E) is overlain unconformably by the Betts Creek beds. Outcrops of the Boonderoo beds are restricted to an inlier in the bottom of Galah Gorge at the type section in the Hughenden area. The Boonderoo beds' age is uncertain; poorly preserved plant fossils suggested a Permian age (White, 1964), but Evans (1964) proposed an early Lower Permian age with Unit Plc or late Stage 2 age. Vine & others (1964) documented an incomplete section in the beds about 200 m thick. They comment that the Boonderoo beds are mainly glacial outwash with varves deposited in a glacial lake.

The term "*Betts Creek Series*" was used by Reid (1916), and Vine & others (1964) employed several other informal terms to describe what was subsequently redefined as Betts Creek beds. At the type locality (latitude 20°34'S, longitude 145°15'E), conglomerate typical of the lower part of the Betts Creek beds is overlain by *Glossopteris*-bearing mudstone and sandstone, typical of the upper part of the unit. Vine & others (1964) indicate that the Betts Creek beds overlie or are faulted against metamorphic basement in the northeast and unconformably overlie Boonderoo beds. The Betts Creek beds overlap the Boonderoo beds 1.5 km north of Galah Gorge, where they overlie crystalline basement. The beds were also recorded in several coal prospecting shafts and inferred from the logs of several deep-water bores.

The lithology and thickness of the Betts Creek beds varies considerably. Vine & others (1964) indicate that coal and carbonaceous shale appear to be more or less restricted to localities where the beds are thin, or in the upper part of the unit where they are thick. The beds are predominantly interbedded kaolinitic lithic sandstone and micaceous siltstone with tuff beds in places. The very poorly sorted sandstone and mudstone of the Betts Creek beds have fragments up to block size with lithologies that are the same as those from nearby outcrops; a terrestrial mud flow origin is suggested by Vine & others (1964). The variations in thickness of the beds from about 50 m to 370 m is attributed to an irregular basement palaeotopography. At a locality east of Pentland, where the unit is very thin, it is overlapped by the Early Triassic sandstone; and a low-angle unconformity with Triassic rocks is indicated in the sequence exposed at the basin margin northeast of Hughenden, but elsewhere there is apparently no unconformity. The widespread occurrence of coal seams near the top of the Permian sequence, in both outcrop and subsurface, suggests that approximately the same horizon is overlain by Triassic rocks throughout most of the area.

A Late Permian age for the beds is indicated by a macroflora dominated by *Glossopteris* (White, 1964) and the microflora.

A proximal source for the beds' clastics is indicated by the angular grains, and by the thick conglomerates that abut and overlap the metamorphic basement.

Vine & others (1964) consider that the Betts Creek beds were deposited on flood plains and in valleys, in which swamps developed late in Permian time. In the Hughenden Sheet area, most of the Betts Creek beds accumulated as a piedmont marginal to a mountain range of metamorphic basement rocks. Farther south, the land surface was probably much flatter, and swampy conditions conducive to the formation of coal were more extensive.

The name *Warang Sandstone* was first used by Vine & others (1964) for the Triassic sandstones west of Pentland, but has not been applied to, or identified in, sequences in the subsurface. The type section is in a tributary of Betts Creek about 18 km west-southwest of Pentland. The formation is predominantly poorly sorted kaolinitic quartz sandstone, with thin interbeds of red siltstone; the sandstone commonly has coarse sand grains and pebbles. The most consistent direction of sediment transport is southerly with a subordinate easterly component in both the southeast of the Hughenden Sheet and in Charters Towers Sheet areas. The thickness of the Warang Sandstone varies from 130 m to 220 m (incomplete) and may be in excess of 500 m in Hughenden 1 town bore. An outlier of sandstone similar to the Warang Sandstone is present near Charters Towers. Triassic sediments apparently filled a trough extending southeast from Hughenden. The cross-sections across the

Koburra Trough (Plate 19) substantiate the presence of a thickened wedge of Triassic rocks.

Early Triassic spores were identified in the Warang Sandstone by Evans (1964) and he suggested a correlation with the Clematis Group or the Rewan Group.

Vine & others (1964) suggest a fluviatile environment with periodically accelerated sedimentation during rapid floods.

Northwest of Hughenden Sheet area, Jurassic sandstone rests on crystalline basement.

Correlations of Surface and Subsurface Units

The *Boonderoo beds* are lithologically similar to the Jochmus Formation (of the Joe Joe Group) farther south. Gray (1977) and Jackson & others (1981) described the environment of the Jochmus Formation as complex fluvio–lacustrine with a glacial influence. The latter is also postulated for the older Jericho Formation which conformably underlies the Jochmus Formation, so that the suggested correlation may not be precise. This uncertainty is shown in the generalised stratigraphic diagram (Table 10–1).

The *Betts Creek* beds are probably a correlative of the Bandanna Formation equivalent (Bandanna Formation/Colinlea Sandstone interval farther south) (Gray, 1977).

The Triassic *Warang Sandstone* is in part an equivalent of the formations comprising the fourfold division of the Triassic interval in the south. The formations here are the Rewan Group, Dunda beds, Clematis Group, and Moolayember Formation. On palynological evidence, the most likely correlatives are the Rewan Group and the Clematis Group.

Subsurface Galilee Basin and Springsure Shelf

The subsurface Late Carboniferous and Permian strata in the Galilee Basin are conventionally correlated with units on both the Springsure Shelf and the neighbouring Denison Trough of the Bowen Basin. Although continuity of many of the formations between the two basins is almost certainly established, they are generally referred to in the Galilee Basin as equivalents or correlatives. This nomenclature has been followed by Hawkins & Gray (1981), Gray & Swarbrick (1975), and others.

Late Carboniferous and early Permian

Joe Joe Group. Mollan & others (1969) describe the *Joe Joe Formation* (*sic* Joe Joe Group) in outcrop on the Springsure Shelf as follows: "The lower part of the Joe Joe Formation consists of tillitic conglomerate, conglomeratic mudstone, and quartz lithic sandstone. The tillitic conglomerate is mainly a cobble conglomerate with a few boulders. Pebble and cobble conglomerates tend to alternate."

"The upper part of the formation, ..., consists essentially of very fine-grained sandstone, siltstone, fine to medium-grained quartz lithic sandstone, carbonaceous shale with thin coaly bands, fine-grained grey limestone, and tuff. Fine-grained sandstone and siltstone are predominant, ...".

Mollan & others (1969) estimate that the 'formation' is about 600 m thick in the type area. "The formation, and particularly the upper non-conglomeratic part, thins to the east, and thickens to the west of the type area near Joe Joe Creek in the northwest part of the Springsure Sheet area."

To the east of the Nogoa Anticline, there are only isolated outcrops of the conglomeratic lower part, and the upper part has been completely eroded.

The Joe Joe 'Formation' is mostly unconformable with older formations of the Drummond Basin and, in turn, is unconformably or disconformably overlain by the Colinlea Sandstone.

Evidence from outcrop shows the 'formation' was deposited on an uneven palaeo-terrain of Drummond Basin sediments, mainly in glacial lakes from streams fed by glaciers, and Mollan & others (1969) postulated that the "ice sheets advanced and retreated several times". Much of the upper part of the 'formation' accumulated following retreat of the ice, with varved lutite of fine material supplied by glacial meltwater feeding lakes. Periodic dessication of the lake sediments and contemporaneous volcanicity is indicated.

The phenoclasts were derived from a variety of older units to the north and west, namely from: a Middle Devonian coralline limestone from within the Dunstable Volcanics; a variety of lithologies of the Anakie Metamorphics; fine-grained sedimentary rocks of the Ducabrook and Telemon Formations; the Dunstable and Silver Hills Volcanics; granite similar to the Retreat Granite, and granite in the Telemon Anticline; and possibly from a siliceous duricrust. Palynology indicates a Late Carboniferous age, with the uppermost part of the 'formation' in the extreme west ranging up into the early Permian.

The nomenclature of the late Palaeozoic subsurface strata in the northeastern Galilee Basin was formalised by Gray & Swarbrick (1975) and several new formation names were proposed for parts of the Late Carboniferous and Early Permian Joe Joe Group. In order of deposition, these units are the Lake Galilee Sandstone, Jericho Formation, Jochmus Formation, and Aramac Coal Measures. The

name Joe Joe 'Formation' of Mollan & others (1969) had been applied to outcrops which were subsequently shown by stratigraphic drilling to correspond to the Jochmus and Jericho Formations, and to the Lake Galilee Sandstone of the subsurface; hence, it was appropriate to raise the status of the term Joe Joe to a Group. Gray (1976) has also demonstrated that the Joe Joe 'Formation' of the type area consists almost entirely of the Jericho Formation in the subsurface.

The type sections of the *Lake Galilee Sandstone, Jericho* and *Jochmus Formations* are in Lake Galilee 1 well, and that of the Aramac Coal Measure is in QDM Aramac 1 well.

The Joe Joe Group is entirely non-marine and the Jericho and Jochmus Formations show a strong glacial influence, as well as indications of nearby volcanism. Spore assemblages in the group are assigned to Stages 1, 2 and 3, so that its age range is probably Late Carboniferous to Early Permian.

The *Lake Galilee Sandstone* comprises silicified, very fine to medium-grained, well-sorted, quartzose sandstone, with conglomeratic bands, and minor dark-grey to black mudstone in the upper part. It is 263 m thick in the type section, most likely fluviatile in origin, and is probably restricted to the Koburra Trough.

The *Jericho Formation* is widespread in the northeastern Galilee Basin; in the type section it comprises 65% mudstone and siltstone, and 35% sandstone. The sandstone is fine to medium-grained, labile to sub-labile. The formation is 763 m thick in the type section and thins towards the Beryl Ridge by progressive overlap. The formation was probably deposited in a complex fluvial to lacustrine system, which shows a glacial influence. Spore assemblages are characteristic of Stages 1 and 2 of Evans (1969). The Oakleigh Siltstone Member of the Formation is 154 m thick in the type section.

The *Jochmus Formation* is widespread in the northeastern Galilee Basin, except the Beryl Ridge. The lower part consists of about 70% sandstone, a middle part of mudstone, siltstone and tuff, and an upper part of about 75% sandstone, and about 25% siltstone and mudstone. The sandstones are fine to medium-grained, moderately to well sorted, labile, and locally conglomeratic. The middle unit is defined as the Edie Tuff Member. The Jochmus Formation is 755 m thick in the type section and thins from here to the west and south. The environment was complex fluvio–lacustrine with a glacial influence. Spore assemblages are characteristic of Stages 2 and 3 (Evans, 1969).

The *Aramac Coal Measures* are confined to a comparatively small area of the basin, chiefly west of QDM Aramac 1 towards the Maneroo Platform and Beryl Ridge, and in the Lovelle Depression. The formation consists of 49% sandstone, 40% siltstone and shale, and 11% coal. The sandstone is mostly very fine to medium-grained, moderately and well-sorted, quartzose and labile with subangular to subrounded quartz in a while argillaceous matrix. The siltstone and mudstone are carbonaceous and very finely micaceous, and the coal is grey to black and predominantly dull.

The base of the lowest significant coal seam is the criterion used by Gray & Swarbrick (1975), and in this publication, to pick the lower boundary of the formation. However, electric logs in some well sections show sharp changes in SP, resistivity, gamma-ray and sonic logs that are of a slightly different elevation to the lowermost coal; the sonic log is probably the best indicator of the lower boundary.

The top of the Aramac Coal Measures is difficult to choose because of its lithological similarity to the overlying Late Permian sequence. The following criteria (Gray & Swarbrick, 1975) may be used to discern the boundary:

(1) The spore assemblages in the Aramac Coal Measures are assigned to Stage 3 of Evans, and those in the Colinlea Sandstone and Bandanna Formation and equivalent to Stage 5.
(2) The average of gamma-ray readings in the sandstone of the Aramac Coal Measures is generally higher than for the Colinlea Sandstone correlative, but the average of resistivity readings is lower.
(3) The Aramac Coal Measures contain generally fine to medium-grained, fairly sorted sandstones, whereas the Colinlea Sandstone has fine to coarse and pebbly, fairly and poorly sorted sandstone.
(4) In the QDM Aramac 1 well, the coals of the Aramac Coal Measures have more clastic material than the coals of the Colinlea Sandstone.
(5) The thickness of the Aramac Coal Measures varies considerably probably because its upper boundary is an unconformity. The Colinlea Sandstone and other Late Permian formations maintain a fairly uniform thickness.

The thickest sequence in the Aramac Coal Measures is 271 m in Lovelle Downs 1 in the Lovelle Depression, and thicknesses elsewhere vary from 34 m near the Beryl Ridge, to 88 m in the type section, and 100 m near the Hulton–Rand Structure.

Gray & Swarbrick (1975) consider that the Aramac Coal Measures are probably a facies variant of the upper part of the Jochmus Formation in the Koburra Trough. An early Permian Stage 3 age (Evans, 1969) is indicated by palynomorphs and, hence, the Aramac Coal Measures are of the same age as the Reids Dome beds of the western Bowen Basin.

Unnamed sequence–Lovelle Depression. In the Lovelle Depression and nearby areas, the pre-Aramac Coal Measures have not been formally subdivided and have been designated as an unnamed unit. In Lovelle Downs 1, the sequence has been divided into two informal units as follows: (1) Upper Unit, 274 m thick, with interbedded coal,

medium to coarse-grained, poorly consolidated sandstone; grey and variegated, in part calcareous shale; and dark-grey to black, very carbonaceous siltstone. (2) Lower Unit, 133 m thick, sandstone, medium to coarse-grained, mainly angular quartz, mostly poorly consolidated, probably with an argillaceous matrix.

These two units are not readily equated with those described elsewhere in the Joe Joe Group. The upper unit has been assigned a Stage 3 age, and a similar age for the Lower Unit would indicate that the Lovelle Depression was initiated at a much later stage than the Koburra Trough and the main part of the Galilee Basin, where Stages 1 and 2 palynofloral assemblages have been described. The westward-thickening of the Permo-Triassic across the northern part of the Cork Fault is about 300 m.

Unnamed sequence–Weston 1. Weston 1 is the only well in which a sequence of intermediate age between the Upper Stage 5 age of the Bandanna Formation/Colinlea Sandstone correlatives and the Stage 3 age of the Aramac Coal Measures has been reported. Price (1974), in the Weston 1 well-completion report by Watson (1974), suggested a Lower Stage 5a age for a lutite at 1484 m. The sample collected at this depth is a medium grey, firm, non-fissile claystone. Lithologically, this unit is closely more related to the coal-bearing sequence of the Bandanna Formation correlative (Hawkins & Harrison, 1978). However, detailed lithological evidence is lacking, so that an additional unit may be present.

Late Permian

On the Springsure Shelf (Fig. 10–2), a fourfold division of the Late Permian is recognised with correlatives of the Bandanna Formation, Black Alley Shale, Peawaddy Formation of the Denison Trough, and the Colinlea Sandstone of the Springsure Shelf.

West of the Springsure Shelf, in areas where the marine intercalation cannot be recognised, a basic twofold division is present in well sections; the marine Peawaddy Formation and Black Alley Shale having wedged out by northwestward facies change. Farther west, in the remainder of the basin, the Late Permian strata cannot be divided and are here referred to as Bandanna Formation equivalent.

Other authors (Gray & Swarbrick, 1975; Hawkins & Gray, 1981) have described this unit as undifferentiated Colinlea Sandstone and Bandanna Formation correlatives. However, the lithology of this Late Permian sequence suggests that it is more akin to the Bandanna Formation than the Colinlea Sandstone.

Colinlea Sandstone. Colinlea 'Series' and 'Formation' were the names originally given to the beds between the Joe Joe 'Formation' (now Group) and the Mantuan *Productus* beds. It was redefined by Mollan & others (1969), and the Mantual *Productus* beds were referred to as the Peawaddy Formation, and the lower sandstone portion to the Colinlea Sandstone.

The type section (Section S5 of Mollan & others, 1969) is in the northern part of the Springsure Sheet about 12 km east of the Nogoa Anticline, where it is 189 m thick; the top of the formation is obscured here by Tertiary basalt.

Mollan & others (1969) described the Colinlea Sandstone as comprising: *Sandstone*–fine to medium-grained, quartzose, usually porous with some kaolin in the matrix. Commonly thick to medium bedded, thin bedded to laminated near the top; cross-bedding and festoon bedding ubiquitous. *Conglomerate*–granule, pebble, grading to pebbly sandstone, commonly porous with some kaolin in the matrix; ferruginised logs in places. Conglomerate is more frequent near the base of the formation. *Siltstone*–occurs as thin friable purplish interbeds with plant fossils.

The origin of the Colinlea Sandstone is described as a fluvial sheet deposited on the stable Springsure Shelf. In the west, a west to southwest provenance is demonstrated for the lower part of the formation and a south to southeasterly provenance for the upper part. In the type area, a southwesterly provenance is indicated for the lower part and a northwest and easterly one for the upper part. A source in Devonian and Carboniferous rocks is suggested, with some clasts derived from the Joe Joe Formation.

The Colinlea Sandstone is equivalent to the interval from the middle conglomerate member of the Aldebaran Sandstone to the top of the Catherine Sandstone in the Denison Trough, thus representing comparatively slow or intermittent sedimentation on the Springsure Shelf. The correlation is based on palynological evidence. Petrographically, the lower and upper parts of the Colinlea Sandstone is similar, respectively, to the Aldebaran and Catherine Sandstones.

The Colinlea Sandstone thins progressively westward across the Springsure Shelf, and Gray (1976) suggested this possibly occurs by progressive onlap of older beds.

Peawaddy Formation. This name (Mollan & others, 1964, 1969) is used for a sequence of about 150 m of lithic sandstone and siltstone above the Colinlea Sandstone in the western part of the Springsure Sheet. It is overlain by the Black Alley Shale. It contains the Mantuan *Productus* bed at or near the top in a lithic quartz sandstone. The type section is on the western limb of the Consuelo Anticline (S22 of Mollan & others, 1969) where it is 137 m thick.

The formation has siltstone, carbonaceous shale, and lithic quartz sandstone. The latter has volcanic fragments and some feldspar and a little mica, has a chloritic and calcareous matrix, and is rarely glauconitic. The sandstone is probably derived from a granitic and volcanic terrane. The siltstone

and shale commonly contain pyrite, jarosite and gypsum on bedding planes, and were probably deposited in a shallow restricted brackish environment. The cobbles and boulders of hornfels granite and schist in the argillaceous sediments were possibly derived from the Anakie Metamorphics.

The Peawaddy Formation is probably disconformable with both the underlying Colinlea Sandstone and the overlying Black Alley Shale. The Peawaddy Formation becomes progressively sandier westwards across the Springsure Shelf and grades laterally into the lower part of the Bandanna Formation. In outcrop west of the Birkhead Anticline, the Peawaddy Formation is indistinguishable from the upper part of the Colinlea Sandstone.

Evidence for a westerly progradation is based on the observations (Gray, 1976) that the Peawaddy marine transgression extends farther west than the Ingelara-marine transgression and that the Mantuan *Productus* bed occurs at the top of the Peawaddy Formation in the Denison Trough, but some distance below the top of the unit on the Springsure Shelf.

Black Alley Shale. The type section of the Black Alley Shale (S31 of Mollan & others, 1969) is in the southeastern corner of the Springsure Sheet, where it is 95 m thick. It consists mostly of dark shale with characteristic soapy montmorillonitic (bentonitic) beds of tuff. Thin well-cemented ferruginous beds, minor siltstone and rare sandy units are present. The bentonite (tuff) and acritarch swarms, indicate slow deposition in a silled basin, with periodic emergence indicated by ferruginised beds. Logs and trees near the top of the formation demonstrate a transition to a paludal environment.

The Black Alley Shale represents a transition zone between the marine Peawaddy Formation and the paludal Bandanna Formation and Blackwater Group. The Bandanna Formation (Power, 1966) conformably overlies the Black Alley Shale with a very gradational contact and the westward extension of the Black Alley Shale grades laterally into the lower part of the Bandanna Formation.

Blackwater Group. Blackwater Group is the name used by Malone & others (1969) for the Late Permian non-marine formations in the Duaringa Sheet. Mollan & others (1969) use the term for the upper part of the Bandanna Formation as opposed to defining a new name in the Springsure Sheet. They reason that the interval designated as the Blackwater Group is almost certainly equivalent to part of the sequence in the type area, and because the interval in the Springsure area cannot be reliably equated with a specific interval in this type area. They also indicate that all or part of the Black Alley Shale is equivalent to part of the Blackwater Group. In places, where the Blackwater Group is in contact with the Black Alley Shale, the boundary is apparently conformable or locally disconformable.

The group comprises a thinly interbedded sequence of greenish and commonly calcareous, lithic sandstone, siltstone, carbonaceous shale, and coal seams. Sandstone is more common in the basal part of the group. The group is characterised by its coal seams and leaf-bearing beds; oil shale and minor beds of clay are present in places.

The group originated in a predominantly paludal and lacustrine environment; sandstone beds are fluviatile; thin interbedding of arenite, lutite and coal indicates intermittent subsidence, with contorted sandstone formed by disturbance of unconsolidated layers of sand.

Mollan (1972) indicates that the lower part of the Blackwater Group consists essentially of festoon-bedded fluviatile lithic sandstone; with the upper part having similar sandstone, interbedded with siltstone, shale and coal. He suggested the environment alternated between fluviatile, deltaic, and paludal.

Bandanna Formation. As mentioned previously, the term Blackwater Group was used for the interval formerly regarded as the upper part of the Bandanna Formation (Hill, 1957) between the top of the Black Alley Shale and the base of the Triassic Rewan Group. The name Bandanna Formation was first used by Maxwell (1954) and defined by Hill (1957), who divided the formation into two units. The lower unit has mostly shale and the upper unit a friable in part calcareous sandstone, sandy limestone, grit, sandy shale, carbonaceous clay, coal and oil shale seams.

It is apparent that the term "Bandanna Formation correlative", in common usage in recent publications, corresponds to the upper unit of the Bandanna Formation of Hill (1957), and to the Blackwater Group as used by Mollan & others (1969).

Triassic

The boundaries of the Triassic rocks have been tabulated (see data base) but no attempt is made here to subdivide the sequence. The Triassic sediments, predominantly mudstone, siltstone and sandstone, are mainly fluvial and lacustrine in origin (Jackson & others, 1981) and range in thickness from 194 m in the Lovelle Depression, 1230 m in the Koburra Trough, 31 m on the Beryl Ridge, 300–500 m on the Springsure Shelf, and about 70 m in the Powell Depression.

Permian Coal Measure Sequences in Structural Regions

The following sections describe Permian Coal Measures with characteristic sequences to be found in individual structural regions within the Galilee

Basin (the structural divisions of the basin shown on Plates 2 and 18 and the unit thicknesses are given in Table 10–4).

Lovelle Depression

The Permian sequence in Lovelle Downs 1 is situated about 50 km northeast of the depocentre of both Early Permian and Late Permian coal measures. About 115 m of Bandanna Formation equivalent unconformably overlies 271 m of Aramac Coal Measures correlative.

The Late Permian Bandanna Formation equivalent has two parts — an upper part (about 71 m) of grey and variegated shale, very fine to medium-grained siliceous sandstone, brown-grey, variegated carbonaceous siltstone, and black coal. The lower part has medium to coarse-grained sandstone, subrounded to sub-angular, friable with an argillaceous cement. This sandstone has been equated with the Colinlea Sandstone by some authors (Hawkins & Harrison, 1978).

The upper unit of the Early Permian Aramac Coal Measures correlative consists of medium to coarse-grained poorly consolidated sandstone, grey and variegated and in part calcareous shale, dark grey to black very carbonaceous siltstone, and black coal.

The lower unit of the coal measures is made up of medium to coarse-grained sandstone with mainly angular quartz, mostly poorly consolidated and with an argillaceous matrix.

Palynology suggests that sedimentation in the Lovelle Depression commenced at a later stage (Stage 3 time) than the Koburra Trough in which there are representatives of Stages 1 and 2. Thickening of the Permo-Triassic sequence across the Cork Fault is in places of the order of 300 m.

Interpretation of electric logs indicates that the Bandanna Formation contains about 30% coal, and the Aramac Coal Measures about 20% coal.

Fining-up sequences are evident in the Bandanna Formation from gamma-ray logs, but there is no strong indication of similar grain-size variations in the Aramac Coal Measures.

Elderslie Ridge

Goleburra 1 is the only deep well drilled on the Elderslie Ridge. The Bandanna Formation equivalent is 53 m thick and the unconformably underlying Aramac Coal Measures equivalent 80 m; that is, only about one-third of the thickness compared to that in the Lovelle Downs 1 well to the north in the Lovelle Depression.

The top of the Permian sediments in this well are strongly silicified and resemble a silcrete with iron staining and welded grain contacts. The Bandanna Formation equivalent consists of light grey, clear to translucent quartzite and some orthoquartzite and medium grey, blocky, splintery, silty mostly micromicaceous shale, grading in part to siltstone. It has carbonaceous matter, but no coal.

The Aramac Coal Measures equivalent has mainly siltstone, sandstone, coal and minor shale. The sandstone is light grey, friable, with clear and milky subangular medium-grained quartz, and grades in places to moderately tought, finer-grained sandstone. Siltstone is medium grey to brownish grey, medium brown, carbonaceous, moderately friable, and in part calcareous. Siltstone lower in the formation is light to medium grey, moderately tough, grading to very fine-grained slightly calcareous sandstone. (This siltstone is reported as 'glauconitic' in part, but the identification and a similar report of 'glauconite' from the underlying unnamed equivalent of the Joe Joe Group must remain doubtful.) Coal in the Aramac Coal Measures is black to dark brown, and occurs in five significant intervals with an aggregate thickness of about 16 m and four minor intervals with a total of about 2 m and together constitute about 22% of the formation.

Cores recovered from the formation include: sandstone, light grey, firm, with abundant clay, non-calcareous, medium to fine-grained, micaceous, non-porous; siltstone, light to dark grey, thinly bedded, micaceous, carbonaceous, grading to very fine-grained, non-porous sandstone; shale, dark grey, friable, carbonaceous; and coal, friable, dark brown to black.

A comparison of sediment thicknesses in Goleburra 1 and Lovell Downs 1 indicate several episodes of faulting or gradual down-warping in the Lovelle Depression. Comparative thicknesses (m) are:

	Goleburra 1	*Lovelle Downs 1*
Jurassic/Cretaceous	1212	1381
Triassic	30	106
Late Permian	53	115
Early Permian (Aramac Coal Measures)	80	271
Joe Joe Group (Total)	226	406

Beryl Ridge

The Beryl Ridge lies north of the Maneroo Platform and constitutes a meridional anticline; both Early and Later Permian sediments were intersected in Beryl 1 drilled on this structure, and in Brookwood 1 a little farther east. The Bandanna Formation equivalent is 102 m thick in Beryl 1 and consists of white medium to coarse-grained, angular to subrounded, poorly to fairly sorted sandstone; grey, argillaceous feldspathic, quartzose, and minor carbonaceous siltstone, carbonaceous shale, and vitreous coal.

The Aramac Coal Measures are 62 m thick and are underlain by 70 m of pre-Aramac Joe Joe Group before basement rocks were encountered. The Joe Joe Group sequence consists of fine to coarse-grained sandstone, which is subangular to

subrounded, slightly porous to porous, argillaceous micaceous and quartzose, and is fairly well sorted; grey argillaceous feldspathic, arenaceous and quartzose siltstone; and grey carbonaceous shale and coal.

The nearby Brookwood 1 well has a thicker Bandanna Formation equivalent (136 m), about the same thickness of Aramac Coal Measures (65 m), and a much thicker sequence of pre-Aramac Joe Joe Group. Poorly defined coarsening-up sequences are present in both the Bandanna Formation equivalent and Aramac Coal Measures, and the log responses indicate characteristics of a fluvio–deltaic system — chiefly of upper delta plain fluvial deposition.

Koburra Trough

The sequence in Lake Galilee 1 is typical of that encountered in the Koburra Trough. The Bandanna Formation equivalent in this well is 198 m thick, but there is no representative of the Aramac Coal Measures. The Bandanna Formation has about 50% green and light to dark grey and black shale, which is in part carbonaceous, sandy, silty and micaceous, with well-preserved plant remains. The formation contains about 20% white to light grey, friable, fine-grained to granular sandstone, mostly well sorted, argillaceous, micaceous carbonaceous and lithic. Coal occurs in 26 seams and is dark brown, earthy to black, vitreous and blocky, and comprises about 30% of the section with coal intervals up to about 5 m thick as interpreted from electric logs. The Bandanna Formation exhibits fining-up sequences based on lithology and gamma-ray logs.

Eastern Margin

The sequence in Galilee NS29 is close to the eastern margin of the basin in an area where open-cut extraction of coal may be feasible. About 176 m of Late Permian Bandanna Formation equivalent unconformably overlies Early Permian Joe Joe Group. The formation is made up mostly of sandstone with minor mudstone and siltstone. Coal seams constitute about 32% and, excluding carbonaceous mudstone and stone bands, the proportion of coal is about 19%. The seams dip about 2° west. The upper part of the Late Permian is light grey to grey, very fine to medium-grained, labile and sublabile sandstone. The lower part consists of beds of coarse, porous quartzose and micaceous sandstone. Thin beds of arenite below one of the coal seams has abundant fragments of fawn mudstone. Mudstone and siltstone beds are grey to dark grey, and mudstone beds in the coal are almost invariably light fawn, fawn, or greyish fawn.

Springsure Shelf

The Late Permian sequence on the Springsure Shelf is distinguishable by its marine sediments separating the Bandanna Formation and Colinlea Sandstone, and rests unconformably on the Joe Joe Group and, farther east, on the Duckabrook Formation.

The sequence in Tambo 1–1A is typical of that on the Springsure Shelf. The Late Permian sediments here comprise in descending order: Bandanna Formation (76 m), Black Alley Shale (55 m), Peawaddy Formation (20 m), and Colinlea Sandstone (54+ m). Contacts between the formations appear to be conformable, and the Bandanna/Black Alley boundary is conformable and gradational over several metres.

The Colinlea Sandstone consists of 72% sandstone, 11% conglomerate, 9% siltstone, and 8% coal. The sandstone is light grey to light brown, very fine to very coarse-grained, fairly to poorly sorted, subrounded to subangular, sub-labile to quartzose, with a white argillaceous matrix, and pebbly and visibly porous in part. The conglomerate contains mainly lithic pebbles. Siltstone is dark grey to black, and coal black, mostly dull, rich in pyrite and occurs principally in one 4.3 m-thick seam. Other bores in the vicinity have intersected significant coal.

The Peawaddy Formation comprises 86% sandstone, 13% siltstone, and minor conglomerate. Sandstone is green to green-grey and light grey, very fine to medium-grained, well to fairly sorted, subrounded to subangular, labile to sub-labile, with an argillaceous and partly calcareous matrix, and has carbonaceous and micaceous partings throughout. Siltstone is dark grey. The base of the formation is marked by a change downwards to a coarser-grained, more quartzose sandstone and conglomerate of the Colinlea Sandstone.

A bed of coquinite, 0.4 m thick, is present at the top of the Peawaddy Formation, which is probably a correlative of the Mantuan *Productus* bed. This occurrence together with that in Valetta 1 well is the western subsurface limit.

The Black Alley Shale consists of 82% shale and siltstone, 15% sandstone, and minor bentonite, tuff and limestone. Shale is dark grey to black, siltstone grey to dark grey and occurs mainly in the uppermost 10 m of the formation. There are two types of the sandstone: either (1) light grey sandstone, very fine, well sorted subangular to subrounded, labile with an argillaceous matrix, interlaminated with siltstone; or (2) green-grey sandstone, light grey, very fine to medium-grained, fairly to well sorted, sub-angular to subrounded, labile to sublabile, and closely resembling sandstone of the Peawaddy Formation. Cream to light grey-green bentonite and tuff is generally finely interbedded with shale. The Black Alley Shale is more silty and sandy near its base.

The Bandanna Formation is divisible into 69% sandstone, 11% shale, 8% bentonite and tuff, 8% mudstone and siltstone, 3% conglomerate, and very minor sandy limestone. The top and base of the formation consists of sandstone separated by a subunit of thinly interbedded bentonite, shale, mudstone, siltstone and sandstone. Sandstone in the lower part is characteristically green-grey, very fine to medium-grained, cross-bedded, fairly sorted, subrounded to subangular, labile and micaceous, with a calcareous or argillaceous matrix. Sandstone in the upper part is light grey to light green-grey and dark grey, fine to very coarse-grained and conglomeratic, fairly to poorly sorted, subrounded, labile to quartzose, micaceous, and visibly porous in part. Shale is black and carbonaceous, and the bentonite and tuffaceous siltstone and mudstone are light green-grey to grey. Conglomerate, mainly with quartz pebbles, is restricted to the upper part of the formation. Thin beds of bentonite were intersected both in the Bandanna Formation and Black Alley Shale.

Powell Depression

Yongala 1 well is situated in the Powell Depression close to the eastern side of the Canaway Fault. A thin sequence of Late Permian sediments, identified with the Bandanna Formation equivalent, unconformably overlies Early Carboniferous and Devonian sediments of the Adavale Basin. The Permian sequence is 31 m thick and has mainly coal with minor shale, siltstone and sandstone.

Coal is present in three seams, 1 m, 3 m, and 4.6 m thick, and sandstone in three thin beds, 1 m, 1.2 m and 0.6 m thick; the sandstone is grey, brown, fine to medium-grained, poorly sorted with angular quartz and mica grains, carbonaceous laminae, and kaolinitic. The sandstones have poor or no intergranular porosity in cuttings, but good porosities are indicated on the microlog.

Interbedded shale is grey, silty and carbonaceous, and siltstone is grey-brown shaly and carbonaceous.

Conclusions

The small number of control points and variable density of spatial data over the Galilee Basin gives an indication of the paucity of stratigraphic control in most areas. As a result, precise stratigraphic division is not always possible. Many of the stratigraphic units are described as correlatives and clarification of nomenclature is obviously needed. Over most of the basin, the Late Permian formations are referred to as correlatives and in the majority of well sections the whole sequence is undivided and referred to as undivided Bandanna Formation and Colinlea Sandstone correlatives.

Formal stratigraphic nomenclature is required for: (1) The Late Permian undivided sequence over the major part of the basin; (2) the unnamed Early Permian deposits in the Lovelle Depression; and (3) possibly, the unnamed Early Stage 5 sequence in Weston 1. It is obvious, that rationalisation of outcrop geology and its correlation with subsurface stratigraphic units is needed.

It is recommended that the nomenclature currently applied to outcrops at the northeastern margin of the Galilee Basin be abandoned and that the formation names established for the complete sequences in well sections, and those units extrapolated from the Bowen Basin, be applied. It is apparent that most of the outcrops can be equated, at least in part, with formations established in these, more complete, basin cross-sections.

Structure Contour and Isopach Maps

Structure contour maps (Plates 4–7 and 9–11; Figs 10–4 to 10–7) were drawn for the boundaries of major units of the Galilee Basin sequence (Fig. 10–3), and isopach maps (Plates 8 and 12; Fig. 10–8) for the Permian coal measures using information from about 79 well control points (Tables 10–3 and 4). The accuracy of the structure contours in any one area is directly related to abundance and distribution of control points. On the average, there is only one control point for every 3350 km^2. In fact, a comparatively closer spacing of control points exists in the southern part of the Galilee Basin compared to the northern portion, and relatively poor control in the northwestern parts. In the Lovelle Depression and intervening areas as far as near Hughenden, there is, on average, one control point for approximately every 10 000 km^2. Hence the accuracy of structure contours and isopachs is much greater in the southern part of the Galilee Basin.

At the outset of the eastern Australian coal project it was decided to use a control point-spacing of not more than 25 km. As the distribution of wells in the Galilee Basin is for the most part at intervals greater than 25 km, data from all the available petroleum exploration wells, deep water bores, stratigraphic and coal exploratory drill holes (Table 10–5) were used to construct the isopach and structure contour maps. Also employed were the results from the review of regional seismic surveys of the Koburra Trough (Nelson, 1977; and Pinchin, 1978) and Lovelle Depression (Hawkins & Harrison, 1978). The spacing of the seismic network was sufficiently close in these two large areas to allow structure contours to be drawn on

preferentially selected levels. The structure contours, as well as the formation intersections in wells, were used to construct the cross-sections on Plate 19.

Other seismic reports of local areas of the Galilee Basin are listed in Senior & others (1978). Seismic exploration has gained impetus recently mainly as a result of the work done by Esso Australia Exploration. They have undertaken, and at the time of writing (1982), are in the process of conducting, a combined regional and detailed seismic reflection survey in the Galilee Basin using a vibroseis recording technique (White, 1982). None of the results of these recent surveys were available.

When describing structural features on the structure contours at various levels, the convention has been to give them the same name, if they are obviously related, even though the outline of the feature may be different. Any newly recognised structure is named from the nearest well intersecting the structure.

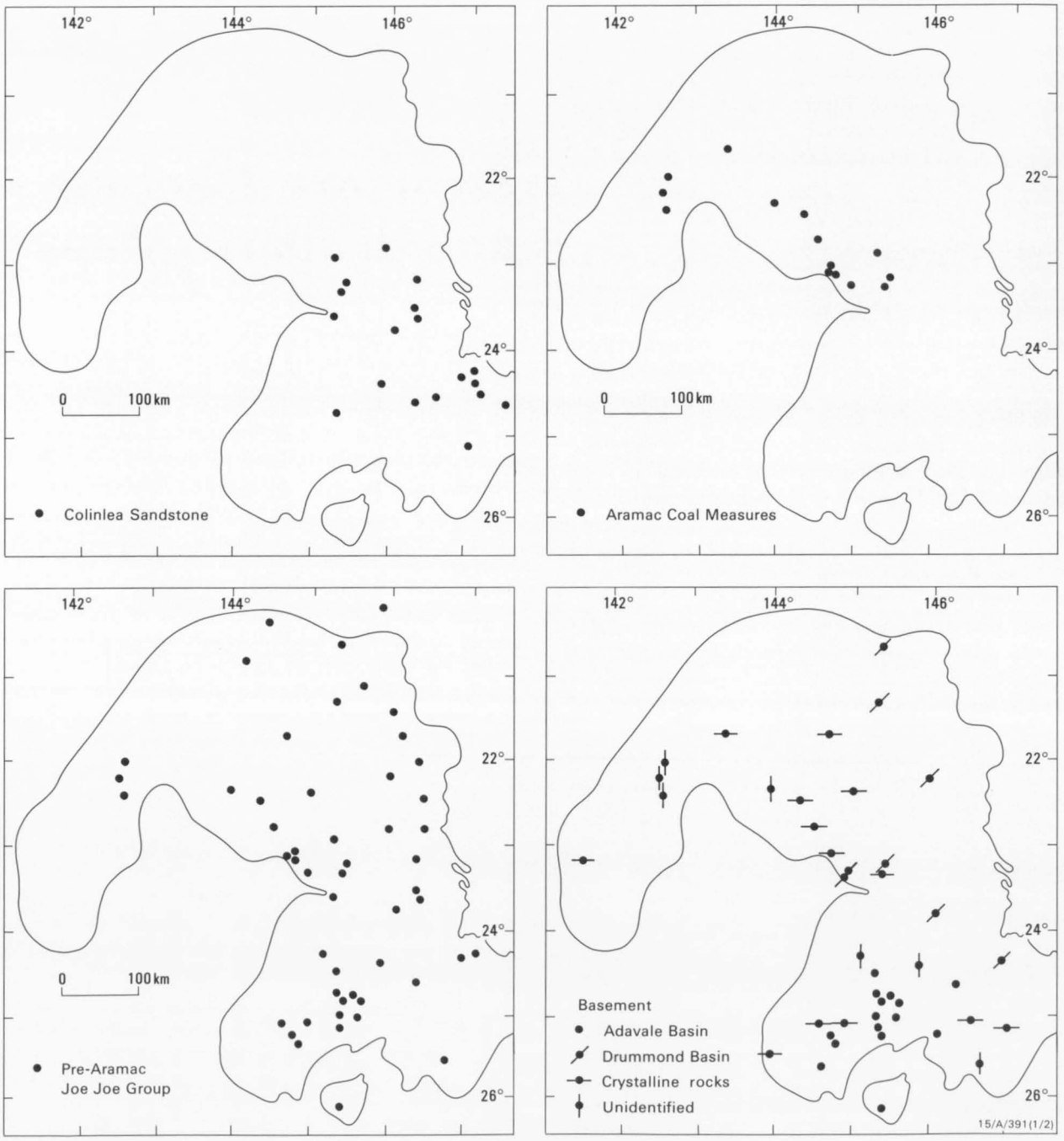
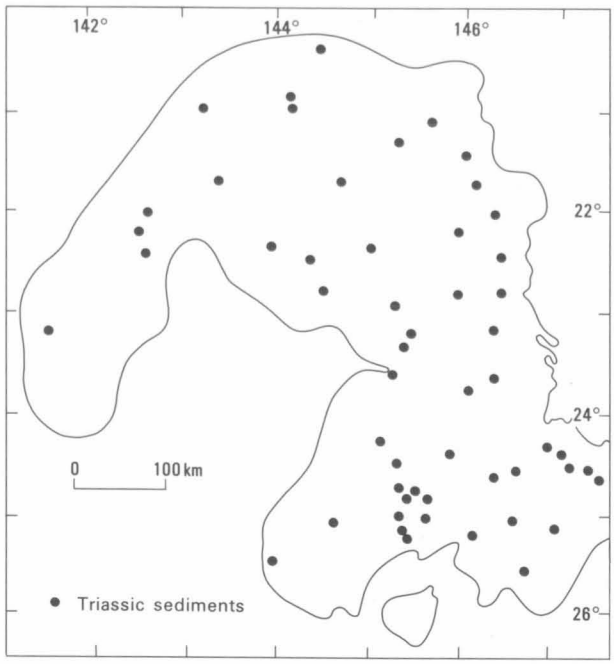
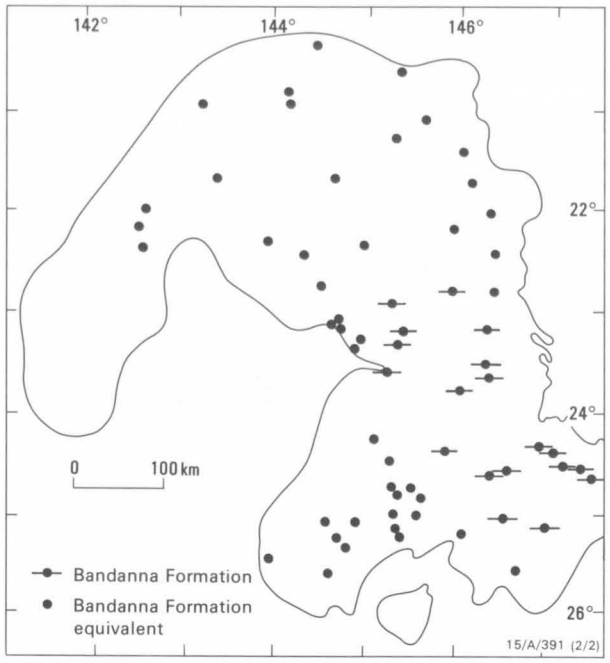


Fig. 10–3. Distribution of formations from well intersections in the Galilee Basin.





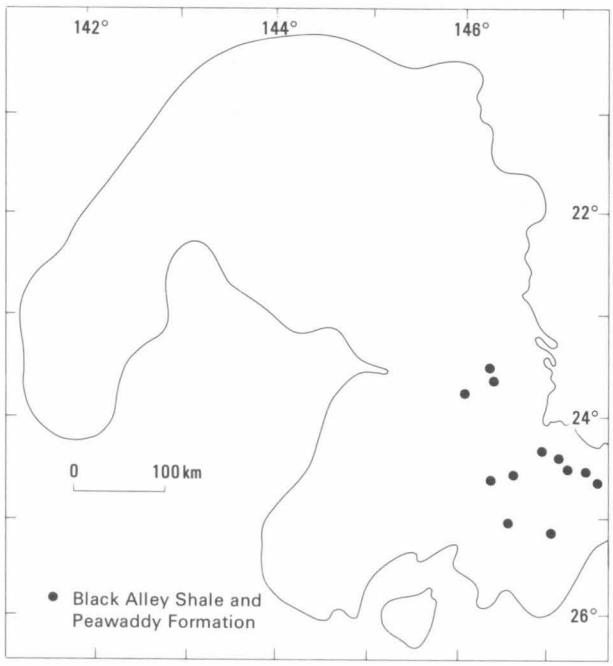


TABLE 10–3. GALILEE BASIN CONTROL POINTS

Reference No.	*Control Point Name*
A 1	CHARTERS TOWERS 1
A 2	GSQ HUGHENDEN 3–4R
A 3	GSQ HUGHENDEN 6
A 4	WATER BORE 364
A 5	GSQ HUGHENDEN 7
A 6	ROWEN LYNN 2
A 7	MPC CORFIELD 1

TABLE 10–3, continued

Reference No.	*Control Point Name*
A 8	HPP WESTON 1
A 9	HPP LOVELLE DOWNS 1
A10	HPP GOLEBURRA 1
A11	CPC OOROONOO 1
A12	AAE TOWERHILL A-1
A13	FPN KOBURRA 1
A14	GSQ GALILEE NS 33

TABLE 10–3, continued

Reference No.	*Control Point Name*
A15	GSQ GALILEE NS 24
A16	GSQ GALILEE NS 29
A17	GSQ GALILEE NS 21
A18	ENL LAKE GALILEE 1
A19	GSQ GALILEE NS 10, 8
A20	GSQ GALILEE NS 5
A21	QDM HEXHAM 1
A22	QDM ARAMAC 1
A23	APC THUNDERBOLT 1
A24	AAO BERYL 1
A25	ENL BROOKWOOD 1
A26	PON MUTTABURRA 1
A27	PAO GLENARAS 1
A28	LOL RAND 1
A29	LOL MARCHMONT 1
A30	LOL SALTERN CREEK 1
A31	LOL HULTON 1
A32	ODN MARANDA 1
A33	BPO COREENA 1
A34	FDN ALICE RIVER 1
A35	GSQ GALILEE NS 1,2
A36	GSQ GALILEE NS 15R
A37	GSQ JERICHO 1
A38	AOD JERICHO 1
A39	GSQ TAMBO 3
A40	GSQ SPRINGSURE 13
A41	GSQ CLAUDE NS 2

TABLE 10–3, continued

Reference No.	*Control Point Name*
A42	GSQ CLAUDE NS 1
A43	GSQ BUCKLAND NS 3
A44	GSQ BUCKLAND NS 2
A45	AMOSEAS CUNNO 1
A46	AMOSEAS BALFOUR 1
A47	BPO VALETTA 1
A48	AMOSEAS WESTBOURNE 1
A49	GSQ TAMBO 1–1A
A50	SPL BIRKHEAD 1
A51	BPO ALLANDALE 1
A52	ASO BARCOO 1
A53	ASO FAIRLEA 1
A54	AAO EASTWOOD 1
A55	AMOSEAS BOREE 1
A56	PAO CARLOW 1
A57	AOP RAVENSBOURNE 1
A58	PAO BONNIE 1
A59	PAO BURY 1
A60	HEP ALVA 1
A61	PAO STAFFORD 1
A62	PPC ETONVALE 1
A63	HEP GREY RANGE 1
A64	PAO COLLABARA 1
A65	PPC GILMORE 1
A66	AOD YONGALA 1
A67	PAO LEOPARDWOOD 1
A68	PAO DARTMOUNTH 1

TABLE 10–4. THICKNESS (in m) OF INTERVALS IN SELECTED STRUCTURAL PROVINCES

	Lovelle Depression	*Elderslie Ridge*	*Beryl Ridge*	*Marchmont Syncline*	*Koburra Trough*	*Hughenden*	*Powell Depression*	*Springsure Shelf*	*Barcaldine Ridge*
EROMANGA BASIN	A9	A10	A24	A29	A13	A3	A66	A45	A34
SEQUENCE	1381	1212	969	960	95	49	1992	361	510
Triassic	A8	A10	A24		A13	A3	A63	A45	A34
	194	30	31	-	1230	151	69	377	255
Bandanna Fm								A45	
								56	
Bandanna Fm	A8	A10	A24	A29	A14	A2	A66		A34
Equivalent	127	53	102	172	208	108	32		31
Black Alley Shale									
Peawaddy Formation								A44	
								119	

TABLE 10–4, continued

	Lovelle Depression	*Elderslie Ridge*	*Beryl Ridge*	*Marchmont Syncline*	*Koburra Trough*	*Hughenden*	*Powell Depression*	*Springsure Shelf*	*Barcaldine Ridge*
Colinlea Sandstone								A45 15	A34 64
Aramac Coal Measures	A9 271	A10 80?	A24 62	A29 100					
Joe Joe Group	A8	A10	A24	A29	A13	A2	A63	A40	A34
Aramac Coal Measures and equivalent	171	146	70	>658	1522	257	126	730	>771
Joe Joe Group and equivalent	A9 406	A10 226	A24 132	A29 >758	A13 1522	A2 257	A63 126	A40 730	A34 >771

Key to well identification:

A44 GSQ Buckland NS 2
A40 GSQ Springsure 13
A45 Amoseas Cunno 1
A34 FDN Alice River 1
A29 LOL Marchmont 1
A24 AAO Beryl 1
A10 HPP Goleburra 1
A9 HPP Lovelle Downs 1
A8 HPP Weston 1
A13 FPN Koburra 1
A2 GSQ Hughenden 3–4R
A3 GSQ Hughenden 6
A14 Galilee NS 33
A66 AOD Yongala 1
A63 HEP Grey Range 1

Structure Contours

Base of Joe Joe Group (Fig. 10–4)

Regional control on structure contours* is available from petroleum exploration wells in the southern Galilee Basin, but there are few data points in its northern part. Structure contours of the Koburra Trough and neighbouring areas of the eastern margin of the Galilee Basin were adapted from seismic structure contours for the top of the Drummond Basin (Nelson, 1981), and the contour values were then adjusted to the known well intersections of basement rocks. This procedure assumes that the horizon mapped as the top of the Drummond Basin sequence corresponds with the base of the Joe Joe Group.

The major structural features apparent at the base of the Joe Joe Group include: the Koburra Trough, Belyando Feature, Springsure Shelf, Powell Depression; also the newly named structures: the Boree Dome, Allandale Syncline and Marchmont Syncline. The Lovelle Depression is inferred from structure contours on younger units.

The dominant structure is the Koburra Trough, which on seismic evidence is about 300 km long and reaches a depth in excess of –3000 km. It is flanked on the west by the Mingobar Monocline/Belyando Feature, and at this edge the base of the Joe Joe Group is steeply inclined basinward. The base of the Joe Joe Group is at a depth, probably in excess, of –2000 m in the Powell and Lovelle Depressions.

The shape of the contours on the Springsure Shelf is controlled by projecting the fold axes apparent at surface, down to the base of the Joe Joe Group boundary. This is justified because the folds and faults have a long history of growth, and folding in the pre-Jurassic sequence is generally reflected by more gentle folding in the overlying sequence (Exon & others, 1972).

The structure contours indicate that the base of the Joe Joe Group is inclined at less than 10°SW. The westerly extent of the shelf is determined by two northeasterly trending culminations: the Boree Dome and the complementary Allandale Syncline. The trend of these structures is parallel to a northerly projection of the Pleasant Creek Arch, and they are possibly both genetically related to this structure. The Boree Dome and Allandale Syncline are possibly confined by the Barcaldine Ridge in the north and do not appear to connect with the Belyando Feature.

The Marchmont Syncline is terminated by the Hulton–Rand Structure and is probably a syn-sedimentary feature.

* Throughout the text the values given to structure contours are in metres relative to mean sea level.

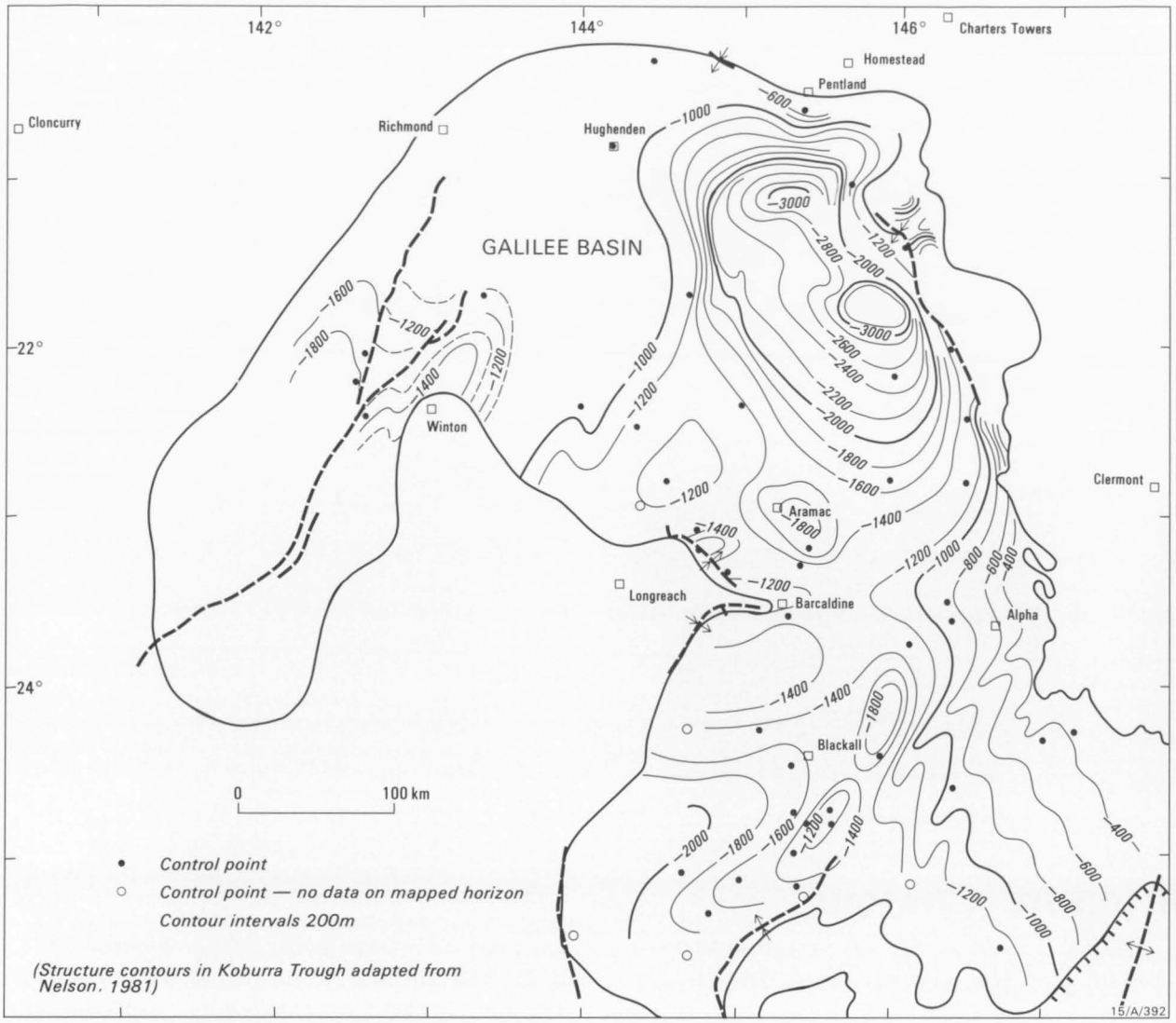


Fig. 10–4. Structure contours on base of Joe Joe Group.

Top of Joe Joe Group (Fig. 10–5)

The principal structural features are similar to those present at the base of the group. The morphology of the Koburra Trough at the base of the Joe Joe Group is poorly known and its general appearance conforms to the trough drawn on the overlying Permian formations; the wide spacing of the control points indicates the lack of control and poor reliability of the contours. The eastern flank of the trough is bounded by steep dips, and has a shelf on its opposite flank grading almost imperceptably westwards into the Beryl and Elderslie Ridges.

The general morphology of the other structures has not changed considerably from base to top of the Joe Joe Group. The only exception is the lack of evidence of the Allandale Syncline. The difference in elevation of the base of the Joe Joe Group from the top of the Boree Dome to the Allandale Syncline is approximately 700 m, but there is no evidence of relief of this magnitude at the top of the Joe Joe Group.

Top of pre-Aramac Joe Joe Group (Fig. 10–6).

The structure contours are essentially the same as those at the top of the Joe Joe Group, with the exception of areas around the Beryl Ridge and Marchmont Syncline which are slightly accentuated.

Top of Aramac Coal Measures (Plate 5)

The structure contours are derived from the top Joe Joe Group and give an indication of the extent of the formation.

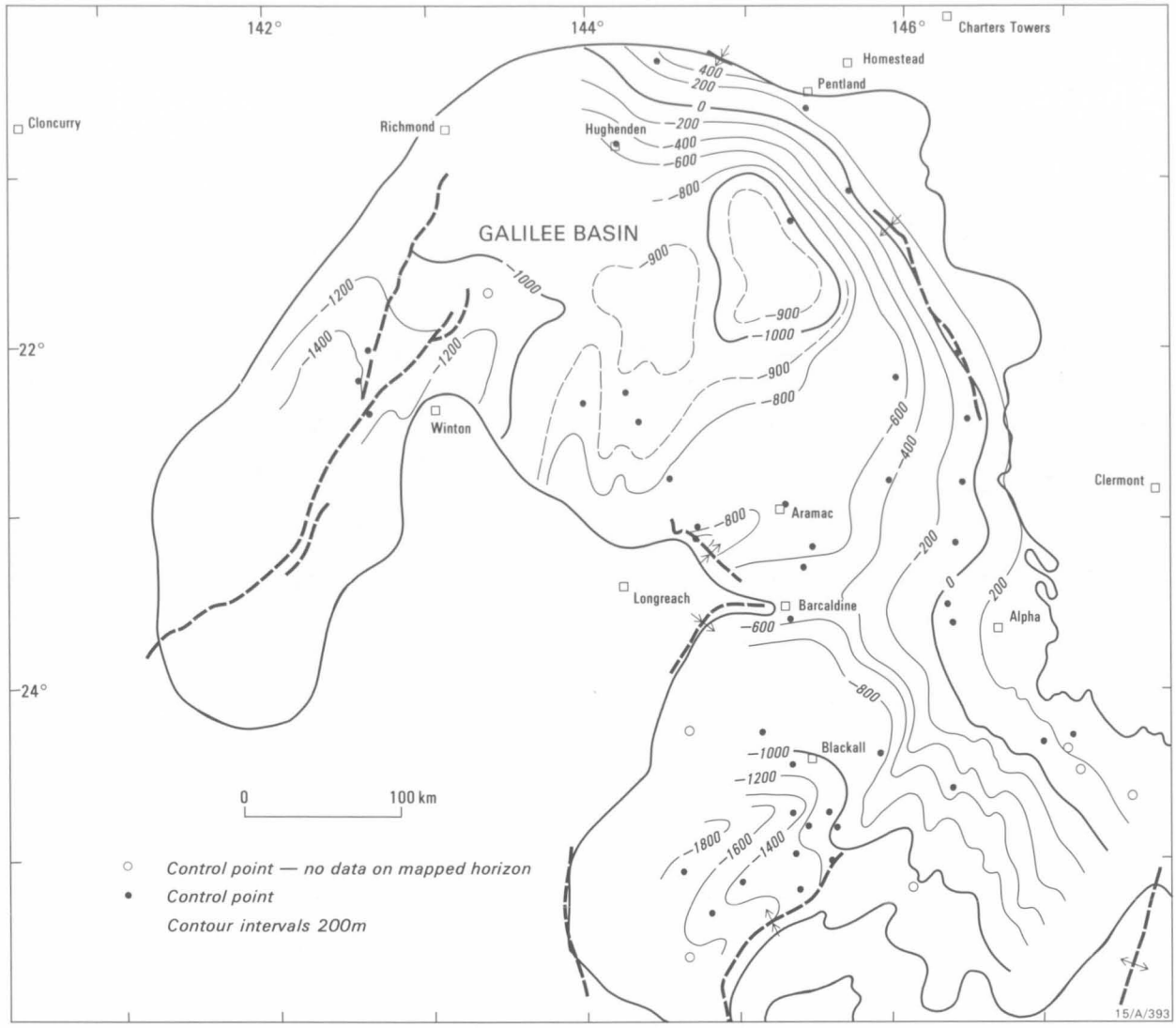


Fig. 10–5. Structure contours on top of Joe Joe Group.

Base of Colinlea Sandstone (Plate 6)

Data on the base of the Colinlea Sandstone is confined mainly to the Springsure Shelf, Powell Depression and southern flanks of the Koburra Trough, which includes areas where the formation is readily differentiated from the overlying Bandanna Formation. The main structures are the Springsure Shelf, Boree Dome, Powell Depression, Barcaldine Ridge and southern part of the Koburra Trough.

The Colinlea Sandstone has been identified in Lovelle Downs 1 and Weston 1 in the Lovelle Depression, but is not indicated on Plate 6 as there is no control on the shape of the contours except for inferences drawn from the contours on the conformably overlying Permian formations. The depth to the base of the Colinlea Sandstone in Lovelle Downs 1 is –1600 m and in Weston 1 –1568 m (Hawkins & Harrison, 1978).

Top of Colinlea Sandstone (Plate 7)

The morphology of structure contours on top Colinlea Sandstone is virtually the same as the base of the Colinlea Sandstone, indicating that the formation maintains a reasonably uniform thickness throughout the basin.

Base of Bandanna Formation and Bandanna Formation equivalent (Plates 9 and 10)

The structure contours on the base of the Bandanna Formation* and Bandanna Formation

* The Bandanna Formation (sensu stricto) is mainly confined to the Springsure Shelf and adjacent basin areas, whereas the Bandanna Formation equivalent is widely distributed in the northern Galilee Basin and in the southern Galilee Basin southwest of the Springsure Shelf.

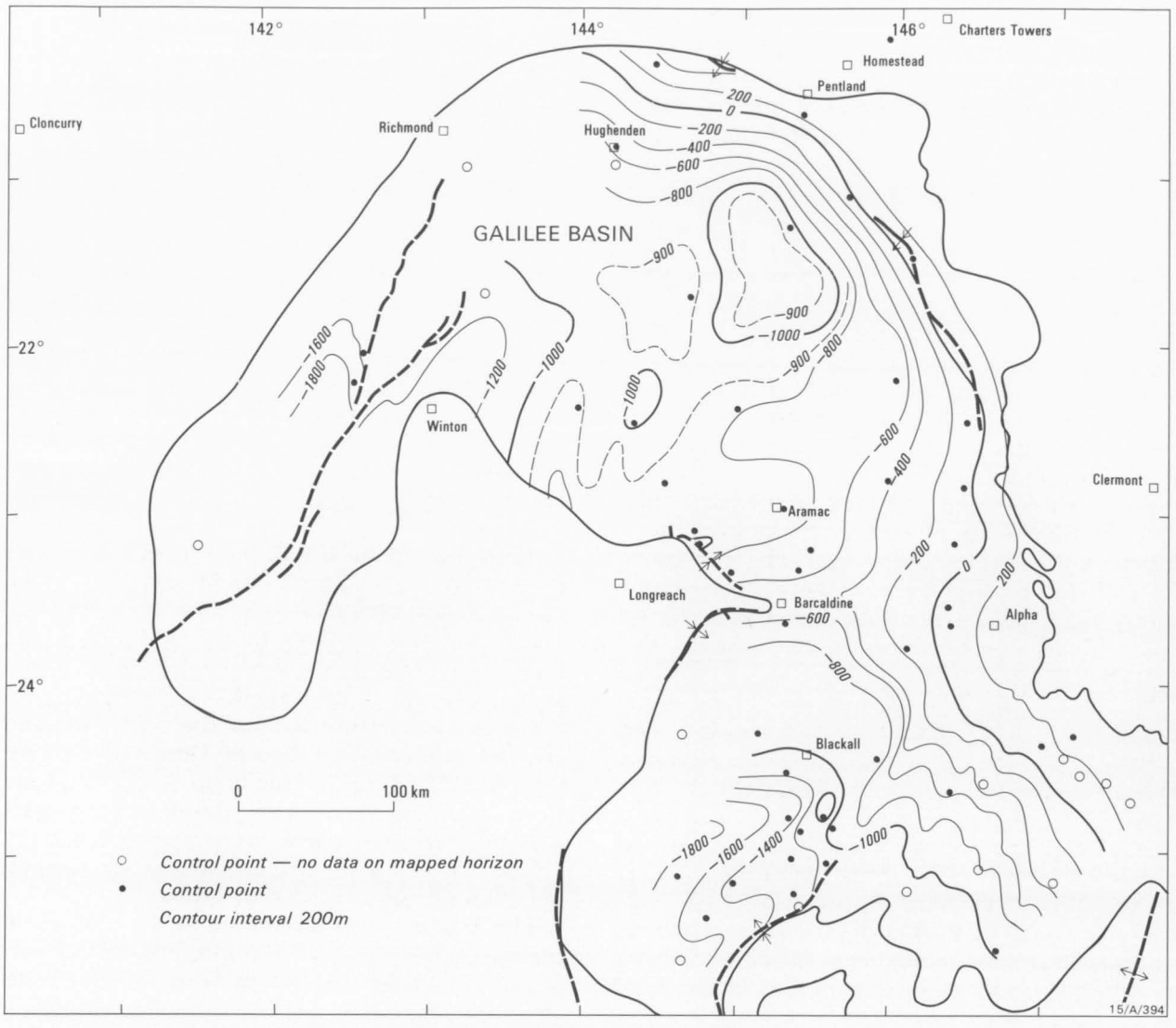


Fig. 10–6. Structure contours on top of pre-Aramac Joe Joe Group.

equivalent are, over a large part of the Galilee basin, based on seismic data. The Late Permian formations are conformable, so that the base of the Permian coal measures sequence should have very similar structural features. The seismic structure contour maps drawn on the 'P' horizon (top Permian of Hawkins & Harrison, 1978; and Nelson, 1981) were used as a guide for the construction of contours on the base of the Late Permian coal measures.

The Late Permian coal measures have an almost basin-wide distribution and the principal structural elements of the basin are apparent. They are the Lovelle Depression, Elderslie Ridge, Beryl Ridge, Koburra Trough, Marchmont Syncline, Barcaldine Ridge, Springsure Shelf, Nebine Ridge, Boree Dome, and Powell Depression. Many of these structures are bounded by the principal marginal or intrabasinal faults.

The base of the Bandanna Formation equivalent reaches a depth of –1887 m in the Powell Depression in Yongala 1 well, whereas shallower depths of –1358 and –1374 m were recorded in the Lovelle Depression. No deep wells exist in the centre of the Koburra Trough and it is inferred from seismic data that the depth to the base of the Bandanna Formation equivalent is below –1100 m. Depths to this base or horizon in both the Marchmont Syncline and at the top of the Boree Dome are of about the same elevation of about –900 m.

The shallowest part of the base of the Bandanna Formation and its equivalent is along the eastern margin of the basin and northern part of the Springsure Shelf, where the formation or equivalent units are in outcrop or subcrop.

Top of Bandanna Formation and Bandanna Formation Equivalent (Plate 11)

The structure contours in the Lovelle Depression are adapted from the top of Permian seismic structure contours of Hawkins & Harrison (1978).

Similarly, the structure contours in the Koburra Trough are derived from the top of the Permian structure contours of Nelson (1981). The values assigned to the contours in both areas have been modified to agree with those of the top of the Permian coal measures (Bandanna Formation and Bandanna Formation equivalent) determined in well sections.

The structure contours are projected across small local areas where data from either well sections or seismic interpretation indicate that Permian sediments are absent. There are several examples of these structures on the seismic interpretation of Hawkins & Harrison (1978), including the Ooroonoo 1 well section where Triassic sediments locally rest unconformably on gneissic granite basement.

The structures at the top Bandanna and equivalent levels are essentially the same as those drawn on the base of this interval. The Bandanna Formation equivalent in the southern Galilee Basin is very thin and the structure contours are practically identical with those at the base of the interval.

The top of the interval reaches a maximum depth of –1855 m in the Powell Depression, and probably in excess of –1100 m in the Koburra Trough and below –1700 m in the Lovelle Depression.

The Bandanna Formation and its equivalents are exposed discontinuously along the eastern margin of the basin, northern Springsure Shelf, and probably occurs at shallow depths at the northern margin. Elsewhere, minimum depths to the top of this interval are about –500 m on the western flank of the Lovelle Depression, and just below –400 m on the Barcaldine Ridge. Clearly, the most important area economically for the exploration of this interval is along the eastern margin of the basin.

Base of Eromanga Basin Sequence (Fig. 10–7)

Structure contours on the base of the Eromanga Basin Sequence in the northern part of the Galilee Basin are adapted from Senior & others (1978). The contours for the southern Galilee Basin are interpreted solely from petroleum exploration wells.

Senior & others (1978) have compiled information from petroleum exploration wells, deep water bores, and interpretation of seismic reflection surveys. The contours have been modified in places where the preferred interpretations of values for the top of the Triassic differ from values posted or, in some cases, where later data is available.

The structure contours on the base of the Eromanga Basin sequence are more reliable than those drawn on deeper levels, because identification of the horizon from seismic refraction results is more certain; in addition a large number of water bores penetrated the top Triassic or older rocks, thus giving greater control on the contours.

No structure contours are drawn in the eastern and northeastern part of the basin where Triassic rocks occur in subcrop over large areas, and there is insufficient data to extrapolate structure contours through this region.

The top of the Galilee Basin sequence is deepest in the Powell Depression (about –1800 m) and at a slightly shallower level in the Lovelle Depression. The major structures at the deeper stratigraphic horizons are still present with some important exceptions: the Koburra Trough is not evident and the top of the Triassic sediments dip gradually southeastwards towards the Maneroo Platform. In the same area, the Beryl Ridge is poorly defined and a small fault marks the axis of the Beryl Anticline.

Apart from major faults, the principal structures present are the Lovelle Depression, Elderslie Ridge, Marchmont Syncline (with an additional smaller satellite syncline to the northwest), the Barcaldine Ridge, Powell Depression, Boree Dome, and Springsure Shelf.

A structural depression to the south of, and complementary to, the Lovelle Depression is centred near the margin of the basin southeast of the Cork Fault. No information exists on deeper levels over this depression with the exception of the top Permian coal measures, where there is a suggestion of a closure at the –1400 m level.

The Mesozoic strata are little deformed and on the Springsure Shelf are estimated to dip between 1 and 2°SW. Late Mesozoic or Tertiary movements were responsible for both the southwesterly tilting of the Galilee Basin region and the corresponding regional dip of the Mesozoic sediments.

Isopachs

Colinlea Sandstone (Plate 8)

Data on the thickness of the Colinlea Sandstone is restricted to the southern part of the Galilee Basin and to a small locality in the Lovelle Depression. Derivation of the sediments from an uplifted area in the Drummond Basin–Anakie Inlier is likely with the eastern extension of the Barcaldine Ridge having controlled sediment dispersal and thickness. A very thin sequence of Colinlea Sandstone, possibly as little as 20 m, is indicated over the ridge. The sandstone thins to the southwest from the Springsure Shelf and only a thin wedge is preserved in the southern part of the Galilee Basin.

The trend of thicknesses in the Lovelle Depression is unknown as it was only intersected in two wells and in each is only about 50 m thick (Lovelle Downs 1, and Weston 1).

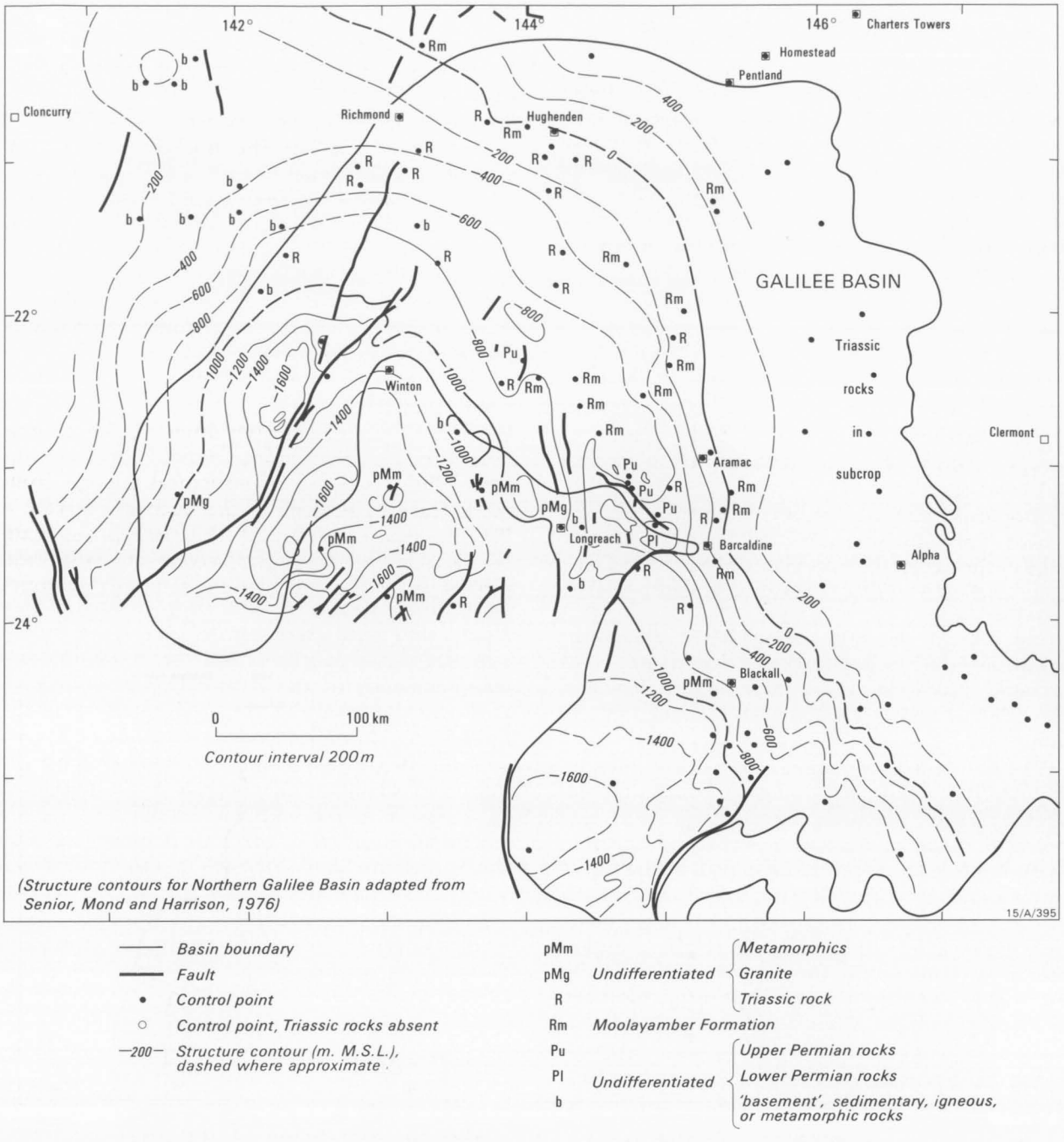


Fig. 10–7. Structure contours on base of Eromanga Basin sequence.

Bandanna Formation and Bandanna Formation Equivalent (Plate 12)

Isopachs drawn on this stratigraphic level include both areas of the Bandanna Formation on the Springsure Shelf and adjacent localities to the west in the Galilee basin, and the Bandanna Formation equivalent in other remaining larger areas of the basin. The Bandanna Formation equivalent may include sequences with both Bandanna Formation (sensu stricto) as well as correlatives of the Colinlea Sandstone. The Bandanna Formation equivalent is lithologically similar to the Bandanna Formation, but the lower part may include the lateral facies equivalents of the Colinlea Sandstone. This should be taken into account in the interpretation of the isopachs.

The thickest sequences in the Bandanna Formation and equivalent are adjacent to the eastern basin margin, suggesting that the sediments were largely derived from the Anakie Inlier Drummond Basin area. Thick sequences in the Lovelle Depression, Marchmont Syncline, and moderately thick sections in the Powell Depression, were also probably derived from neighbouring basement uplifts. Thin sedimentation around the Barcaldine Ridge indicates that it has strongly influenced the depocentres of Bandanna sedimentation.

Aramac Coal Measures (Fig. 10–8)

The information on the thickness of the Aramac Coal Measures is restricted because of the relatively small area (about 60 000 km²) preserved. A major part of the formation was removed by the extensive mid-Permian erosion. The thickest sequences occur in the Marchmont Syncline and Lovelle Depression, but no integrated reconstruction of basin-wide distribution is feasible.

Conclusions

The following conclusions were derived from an interpretation of the structure contours, isopachs, and cross-sections.

(1) Isopachs and cross-sections indicate the inception of the major structural featuress at an early stage in the development of the Galilee Basin. The Late Carboniferous to Early Permian interval clearly shows the Koburra Trough and, possibly, the Lovelle Depression, Barcaldine Ridge, Powell Depression, Springsure Shelf, and other smaller structures.

(2) The Koburra Trough has up to about 3200 m of sediments which is the thickest sedimentary sequence and deepest part of the basin; this sequence consists of mostly Late Carboniferous, Permian and Triassic sediments, and about 200 m of Jurassic and Cretaceous sediments of the Eromanga Basin sequence.

(3) At the early Permian level, the Koburra Trough is less well defined and the Allandale Syncline is not evident. The deepest structural level of the top of the Joe Joe Group is –1750 m in the Powell Depression.

(4) The Colinlea Sandstone interval, the earliest unit of the Late Permian, is restricted in extent but shows little evidence of structural change from those features present in the deeper intervals.

(5) The configuration of the widespread Late Permian coal measures gives a complete basin-wide picture of structure, i.e., on the structure contours

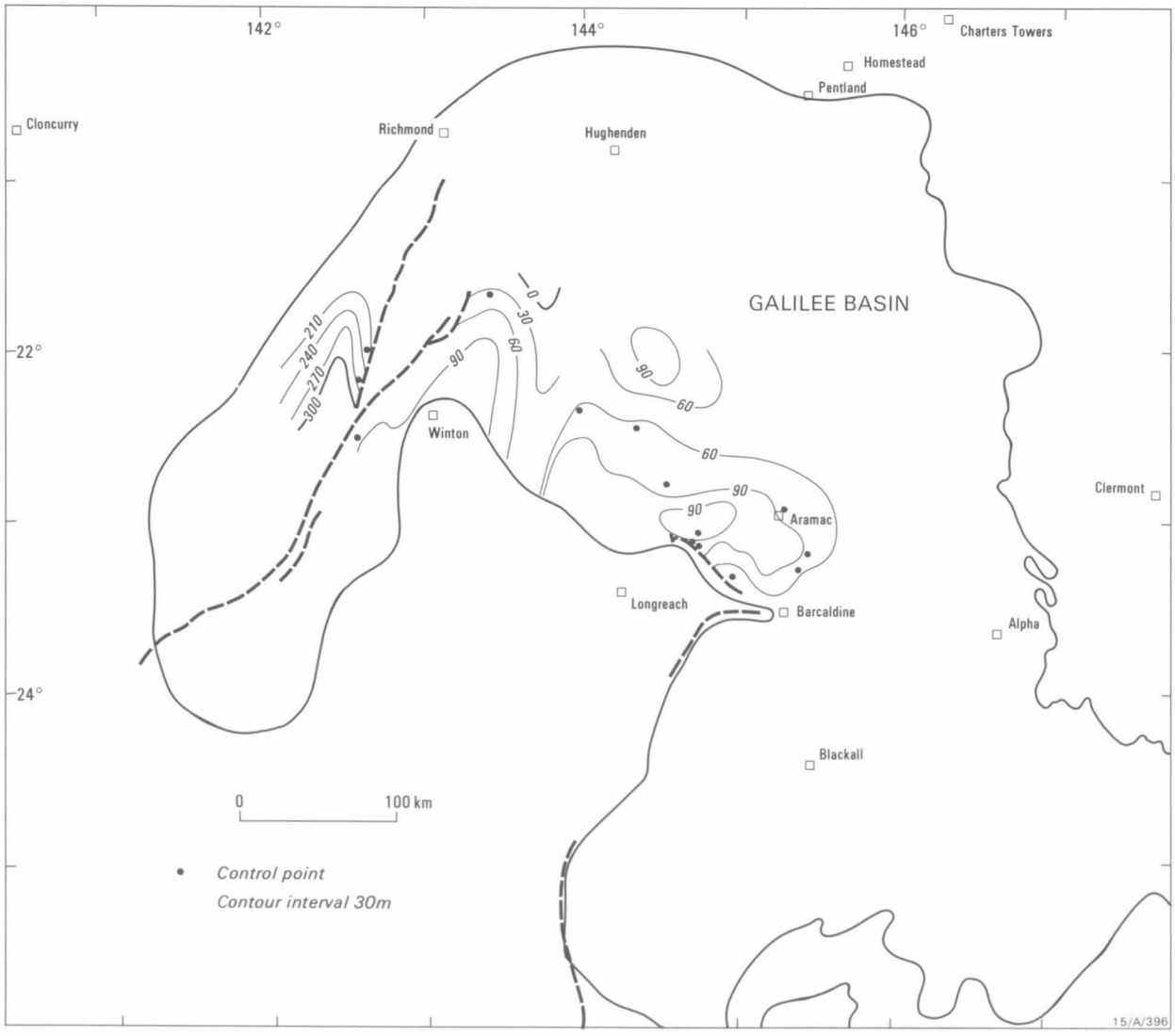


Fig. 10–8. Aramac Coal Measures isopachs.

of Plates 9 to 11. The top of the Late Permian in the Powell Depression at –1850 m is slightly deeper than the same level in the Lovelle Depression. The late Permian is present in subcrop along the eastern basin margin, and northern Springsure Shelf, but over the majority of the basin it is deeply buried beneath younger sequences.

(6) In the Late Permian, a marine trangression inundated the Springsure Shelf; in the southern Galilee Basin the marine sequence transgressed the Colinlea Sandstone and Joe Joe Group; whereas in Valletta 1 overlies basement rocks (granodiorite, equivalent to the Anakie Metamorphics). The Joe Joe Group was presumably removed from the Powell Depression and areas near the Canaway Fault by mid-Permian uplift and erosion.

(7) The Koburra Trough and Springsure Shelf were still subsiding relatively rapidly during the Triassic compared with the Lovelle and Powell Depressions. Cross-sections (Plate 19) all show thickening of the Triassic rocks towards the Galilee basin's eastern margin and on the Springsure Shelf.

The thick Triassic sediments in the east suggests rejuvenation and uplift of the Anakie Inlier in the early Triassic.

(8) Triassic rocks are absent from the Hulton Rand region in the central part of the basin, and in part of the area between the Powell Depression and Springsure Shelf. These areas may have been near the depositional edge during Triassic, although it is just as likely that uplift and removal of some or all of the sequence occurred prior to accumulation of the Eromanga Basin Sequence.

(9) Triassic rocks of intermediate thicknesses are present in the Lovelle Depression and extend eastwards across the Elderslie Ridge. An easterly source for the Triassic in the western domain cannot be discounted.

(10) The base of the Eromanga Basin shows no evidence of the Koburra Trough and it has been replaced by a gently sloping shelf. The Powell and Lovelle Depressions, by contrast, underwent major subsidence during the deposition of the Eromanga Basin sequence.

(11) A measure of relative basin subsidence is illustrated by a comparison of the Lovelle Depression and Koburra Trough. A thick sequence of Galilee Basin sediments is preserved in the Koburra Trough, but subsidence virtually ceased by the end of the mid-Triassic. By contrast, only a thin section of Galilee Basin sediments is preserved in the Lovelle Depression, and sequentially younger formations onlap the basement towards the western margin. The major period of subsidence in the depression was in the Mesozoic with up to 1800 m of sediments preserved.

Coal

Introduction

Detailed geological information on the Permian coal deposits and the characteristics of the coal has been obtained principally from recent exploratory coal drilling by the Queensland Department of Mines, the results of which are in unpublished records of the Geological Survey of Queensland. This drilling was concentrated chiefly on the eastern margin of the Galilee Basin and the relevant reports; the areas described are arranged in geographic order from north to south:

Author	Drill Hole No.	Area
Carr, 1978	Galilee NS 33	Longton
Carr, 1976	Galilee NS 24	Mintna
Carr, 1977	Galilee NS 29	View Hill
Carr, 1974c	Galilee NS 21	Moray Downs
Carr, 1974a	Galilee NS 10, 8	Laglan
Carr, 1973a	Galilee NS 5	Degulla
Carr, 1973b	Galilee NS 1,2	Wendouree
Carr, 1974b	Galilee NS 15R	Lambton Meadows

Reports of stratigraphic drilling by the Department of Mines and Geological Survey of Queensland that contain valuable information on coal occurrences and characteristics are given below. A listing of departmental stratigraphic drilling in Queensland is given in Hawkins & Balfe (1980).

Author	Drill Hole No.
Anderson, 1974	GSQ Tambo 3
Anderson, 1974	GSQ Claude NS 1, 2
Anderson, 1974	GSQ Buckland NS 1, 2, 3
Swarbrick, 1974	GSQ Jericho 1
Wallin, 1974	GSQ Tambo 2
Wallin, 1975b	GSQ Jericho 2
Wallin, 1975a	GSQ Tambo 1, 1A
Gray, 1976	GSQ Springsure 11, 12, 13
Gray, 1977	GSQ Hughenden 1–2R, 3–4R, 5 & 6
Swarbrick & Wallin, 1976	QDM Aramac 1
Swarbrick & Wallin, 1976	QDM Hexham 1
Balfe, 1979	GSQ Hughenden 7, and Charters Towers 1.

In addition, the deep petroleum exploration wells have provided data on the regional distribution and general lithological sequences in the coal measures, but do not provide the detail that is available from the fully cored stratigraphic and exploratory coal drilling.

Coal Geology

Coal is present in both the Early and Late Permian sediments of the Galilee Basin. The Early (Stage 3) Permian coals in the youngest formation of the Joe Joe Group, the Aramac Coal Measures,

are restricted to a comparatively small part of the northern Galilee Basin. They are up to about 270 m thick and electric logs and drill-cutting descriptions of deep wells indicate that the formation has up to 20% coal. However, as they occur at depths mostly in excess of 600 m they are considered uneconomic, for the time being at least.

Conversely, the Late Permian (Stage 5) coal measures are present over wide areas, and over a large part of the basin they have significant coal resources at mineable depths. The coal occurs in the Colinlea Sandstone, Bandanna Formation and Bandanna Formation equivalent. The coal facies of Stage 5 in the northern Galilee Basin has been described by Hawkins (1976) as having a sheet-like geometry with regional thickening in an easterly direction. A coal isolith map (Fig. 10–9), modified from Hawkins, shows three areas of maximum coal development in Stage 5 sediments, namely, the Lovelle Depression and Elderslie Ridge east of the Beryl Ridge, and the thickest in the Koburra Trough. The Koburra Trough is the most important, because the coal measure sequences are present in shallow subcrop along its eastern margin. The thicker coal sequence in this trough has been attributed to continued downwarping in the Late Permian with a parallel decrease in sand deposition. The isopach map of the Bandanna Formation equivalent (Plate 12) shows a thickened lobe of sediments which, together with the sand isolith map (Fig. 10–10) of Hawkins (1976), supports this conclusion.

Elsewhere, depositional thinning of the coal measures is indicated along the northern, western, southwestern and southern margins; however, the eastern and parts of the southern margin are thought to be erosional contacts. Hence, there is little or no coal on either the Springsure Shelf or in the southern part of the Galilee Basin.

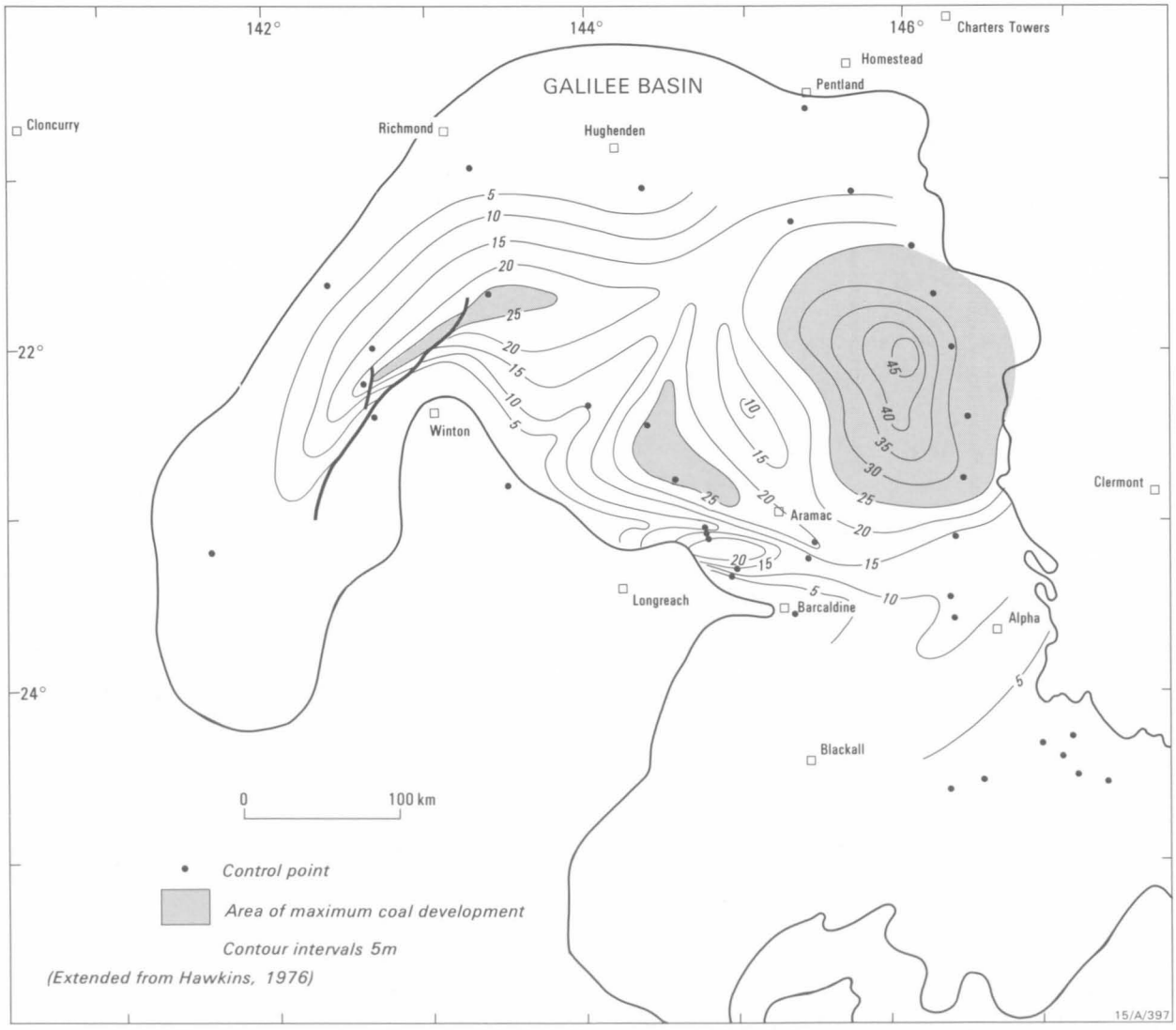


Fig. 10–9. Coal isolith map — Stage 5.

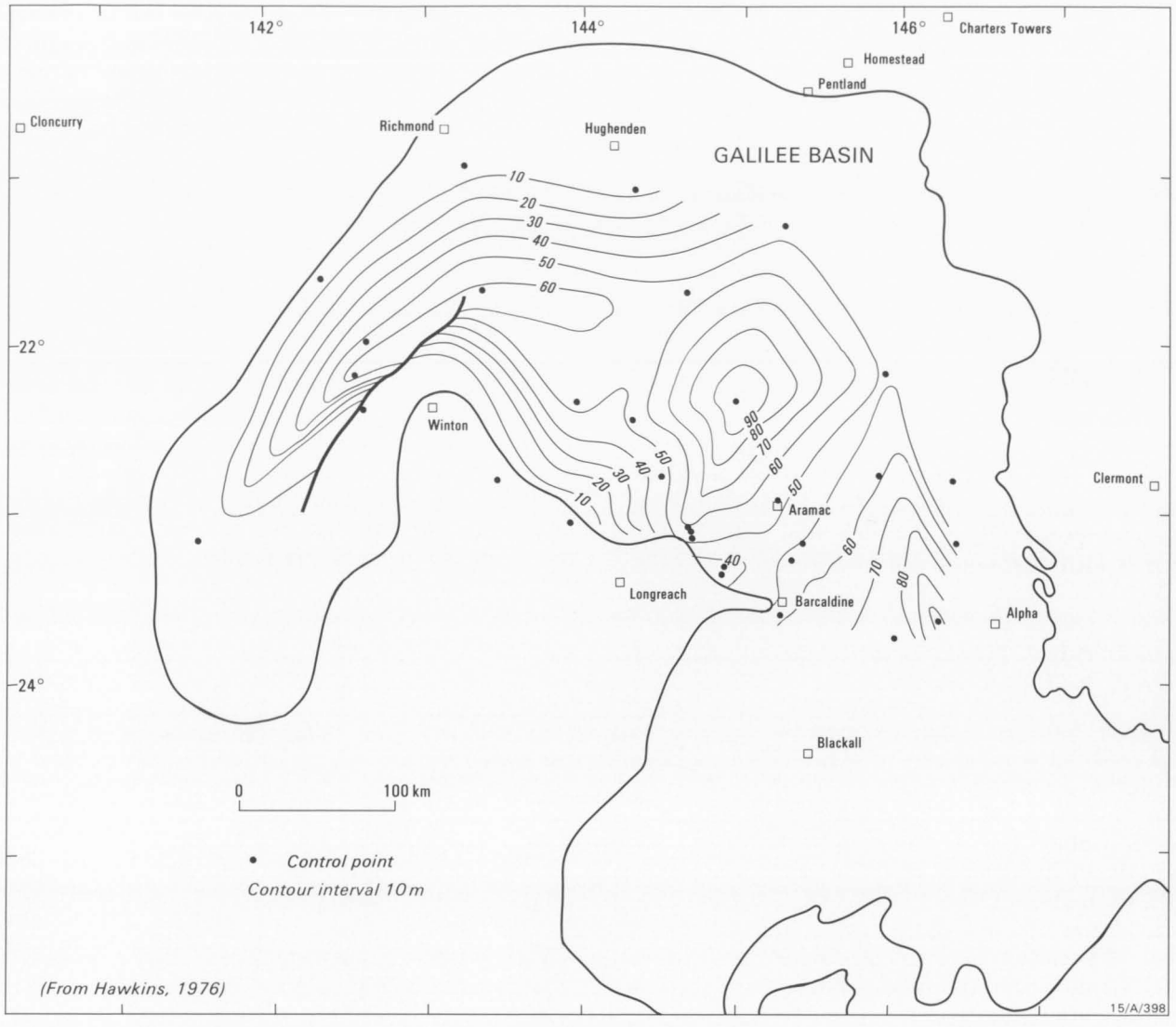


Fig. 10–10. Sandstone isolith map — Stage 5 (net thickness).

Coal Quality

The Late Permian coals of the Galilee Basin are generally of low rank, sub-bituminous A (ASTM Classification) with low sulphur, non-coking, with about 77% carbon, 4.5% hydrogen (sub-hydrous), and 19.5% oxygen. The coal is suitable for the production of steam and of liquid and gaseous hydrocarbons.

Further details of coal properties are discussed in the records of the Queensland Geological Survey, Queensland Department of Mines, listed above, and in chapters 19 to 23, 25 and 29. Vast quantities of readily extractable open-cut coal will be required for steam, liquid and gaseous hydrocarbon production.

Coal Thickness

Coal beds in the northern Galilee Basin range from 0.15 to 9 m thick and the thickest ones are commonly found in the eastern part of the basin. In outcrop, Late Permian coal of the Betts Creek beds (Bandanna Formation equivalent) has been investigated on several occasions in the past. Mt Isa Mines discovered a 2.5 m seam of coal in the Oxley Creek area, and analyses are reported by Carter (1948).

The greatest number of coal beds are confined to three main areas penetrated by deep petroleum exploration wells (Hawkins, 1976). The maximum aggregate thickness is 45 m, or about 23%, of the sequence in Lake Galilee 1; the coal occurs in 26

beds and is dark brown, earthy to black, in intervals up to 5 m thick as estimated from electric logs. In the south-central area, Brookwood 1 has 28 m (or 25%) net coal thickness in 11 coal beds. In the western part of the Basin, the third important area includes Lovelle Downs 1 with 24 m (or 20%) of net coal thickness in 11 coal beds, and Corfield 1 has 27 m (or 23%) net coal thickness within nine coal beds.

Eastern Galilee Basin Coal Deposits

A summary of the principal coal-bearing sediments investigated by drilling along the eastern margin of the basin (Plate 20) is given in 10 sections below. (The source of data is mainly the references in the introduction to this chapter.)

Hughenden Area (GSQ Hughenden 1–2R, 3–4R, 6, 7)

The Betts Creek beds (Bandanna Formation equivalent) were intersected in the GSQ Hughenden 3–4R, 6, and 7 drillholes at the northern edge of the Galilee Basin; GSQ Hughenden 1–2R was completed in Triassic sediments. Coal comprises 62% of the Betts Creek beds in GSQ Hughenden 7, with the remainder composed of 25% sandstone and 13% carbonaceous shale (Gray, 1977). The coal is mostly dull with bright bands, and the top of the formation lies at a depth of 876 m. Reflectance values in the thickest upper seam places the coal at a marginally higher rank than the Late Permian seams on the eastern flank of the Galilee Basin near subcrop. The coal is sub-bituminous and there is a slight increase in rank in relation to the seams on the basin margins. Sulphur content is extremely low. Seams with similar properties occur in the Pentland area (GSQ Hughenden 3–4R; Gray, 1977), which may be a correlative.

A change from a marginal northern sandy facies to a southern basinal shaly facies in the Galilee Basin is exhibited by a cross-section through GSQ Hughenden 7, 1–2R to 6.

In GSQ Hughenden 3–4R, the Betts Creek beds consist of 22% coal and carbonaceous shale; and the remainder of sandstone (50%), siltstone, shale and claystone (23%), and conglomerate (5%). The coal is interbedded with carbonaceous shale and is of poor quality. The Betts Creek beds can be related to the coal measures cored in the upper part of the Late Permian in GSQ Jericho 1 and GSQ Tambo 3; that is the Bandanna Formation equivalent. The Betts Creek beds maintain a fairly uniform thickness over the region indicating deposition on a surface of low relief. Coal is poor quality with the main concentration of seams between 63 and 82 m. Several seams occur between 105 and 145 m, which decrease gradually in thickness with depth from a maximum of 1 m thick at the top.

The Betts Creek beds in GSQ Hughenden 6, by comparison, have only 8% coal and carbonaceous matter; the top of these beds lie at a depth of 202 m. The main differences to the sequence in GSQ Hughenden 3–4R are:

(1) The Betts Creek beds in GSQ Hughenden 6 are coarser-grained and contain more interbedded sandstone than in 3–4R.
(2) Sandstones in GSQ Hughenden 6 have abundant white clay matrix and lack visible porosity, whereas those in GSQ Hughenden 3–4R have less matrix and are generally visibly porous.
(3) The net thickness of coal in the Betts Creek beds is less in GSQ Hughenden 6 than in 3–4R.

These observations indicate that the GSQ Hughenden 6 area was the site of abundant detrital accumulation, possibly derived from a northern provenance, compared to a more quiescent environment with peat swamps in the GSQ Hughenden 3–4 locality. The greatest development of coal was in GSQ Hughenden 3–4R and is of commercial significance. Seams in GSQ Hughenden 7 are deeply buried, but are potentially of economic interest.

Longton Area (Galilee NS33)

The Late Permian (Bandanna Formation equivalent) coal measures dip about 3.5° W and no major faulting is present. The coal seams are poorly developed in contrast to those farther south that have been drilled, and considerable lateral change occurs in the seams that have been drilled at Longton. Overlying Tertiary sediments are up to 104 m thick.

Charters Towers (GSQ Charters Towers 1)

The Boonderoo beds indicate that the basin extended farther northeast than the present erosional margin, and the beds occupy an elongated sub-basin in Early Palaeozoic basement. The coal-bearing units of the Betts Creek beds may be preserved beneath Tertiary sediments between GSQ Charters Towers 1 and the Just Range where the Triassic Warang Sandstone crops out.

Mirtna Area (Galilee NS 24)

The Late Permian sediments are relatively steeply dipping, and are therefore unsuitable for open-cut extraction, especially as the Tertiary overburden is 30–40 m thick. Dips of 15–20° W are recorded in NS 23, possibly steeper in subcrop, and

about 5–10° W in NS 22. This indicates that the seam inclination decreases downdip. No faulting has been detected and one seam (D seam) could be open cut, if a favourable area can be located. The upper seams of the Late Permian deteriorate north of Moray Downs, about 70 km to the south.

View Hill (Galilee NS 29)

Coal constitutes about 19% of the Late Permian (Bandanna Formation equivalent) sediments and the seams lie on a grade of about 1 in 30 (a dip of about 2° W. Tertiary sediments (about 75–80 m thick) occur east of Galilee NS 29, and the removal of Tertiary overburden during mining is the main problem.

Moray Downs (Galilee NS 21)

The seams dip at about 4.5° W, which will limit the breadth of open-cut mining, but otherwise should pose no problems to extraction. The Tertiary sediments are about 35 m thick in holes drilled near the shallowest seam. The coal classification is similar to coals from the Wendouree, Degulla, and Laglan areas (see below).

Laglan Area (Galilee NS 10, 8)

The Late Permian sediments have about 25% coal, but the coal is of relatively low rank and recoverable only by underground methods owing to the thick Tertiary cover and the high water yields at its base. Dips in the seams are low at about 2°, and there are some northwest-trending faults at the eastern basin margin. In places, low-angle faulting with southwest upthrown sides has been postulated close to the subcrop of the base of the Late Permian.

Wendouree–Degulla Area (Galilee NS 5, NS 1 & 2)

The regional dip of the coal in the Degulla area is 1–2° and no major faulting has taken place. The coal is probably recoverable only by underground working.

Although the structure at Wendouree is simple, the coal would have to be won by underground mining, because of the thick (47 m) Tertiary overburden. Both dull and bright coal, commonly interbedded, occurs in the seams in the Wendouree and Degulla areas; very dull, possibly canneloid, coal occurs in Galilee NS 5 and very dull durainous coal in NS 1 and 2. No seatearths have been recorded. A general westward thinning of seams is evident in these areas.

Lambton Meadows (Galilee NS 15R)

The regional dip of the coal seams is less than 1° W and no major faulting has occurred. However, the coal would have to be worked by underground methods owing to the high ratio of Cainozoic overburden thickness to the thin seams. The seams are thinner than at Wendouree and in areas farther north in the Galilee Basin, but can be correlated with those in GSQ Jericho 1 and Wendouree. The Bandanna Formation is more arenaceous than the same sequence penetrated in GSQ Jericho 1 to the south. This change is probably related to the proximity of provenance areas.

Springsure Shelf (Tambo 3, Springsure 11, 12, 13; Claude NS 1, 2; Buckland NS 1, 2 and 3)

The Late Permian sediments on the Springsure Shelf are generally barren of coal, and that present is of very low rank. For example, the thickest seam in the Bandanna Formation is 0.39 m at a depth of 20 m in Buckland NS 1, with a sub-bituminous C rank (ASTM classification). This low rank indicates shallow burial and that the shelf has remained stable since the Permian.

Environments of Deposition of Permian Coal Measures in the Galilee Basin

The environment of the Permian coal-bearing sediments in the Galilee Basin has been described by various authors as summarized below:

Aramac Coal Measures

Interpreted Environment	Reference
Alluvial deltaic plains with streams, distributary channel, and backswamp deposition	Hawkins & Harrison (1978)
Deltaic–paludal	Gray & Swarbrick (1975)
Cyclic deposition, low-energy, alluvial regime in type section	Evans (1980)
Deltaic; alluvial deltaic plains	Hawkins (1978)
Fluvial	Jackson & others (1981)

Colinlea Sandstone	
Alluvial plain deposition	Hawkins & Harrison (1978)
Entirely freshwater in the west Upper delta plain in GSQ Jericho 1	Gray (1976) Swarbrick (1974)
Initially a large alluvial plain that prograded southwards	Hawkins (1976)
Alluvial plain	Hawkins (1978)
Alluvial plain	Jackson & others (1981)
Bandanna Formation	
Delta plain deposition	Hawkins & Harrison (1978)
Widespread paludal and lacustrine conditions	Gray (1976)
Alluvial coal measures	Evans (1980)
Piedmont facies marginal to basin (Betts Creek beds)	Vine & others (1964)
Deltaic sedimentation on a broad coastal plain	Hawkins (1976)
Delta plain, fluvio–deltaic	Hawkins (1978)
Delta plain	Jackson & others (1981)

Data on the environments of the formations in the Galilee Basin are inferred from lithology and lithological sequences, electric log responses, and partly on data in isopach and structure contour maps. No samples were examined and lithologic descriptions are based on those presented in the well completion reports. The major part of the Galilee Basin's Permian succession is considered by most authors as continental and, as already indicated, a variety of environments have been invoked for each formation.

As no detailed investigations have been undertaken and the control point spacing is wide, only broad environmental generalisations will be attempted. The preserved Permian sequences suggest four stages of development, commencing with the Aramac Coal Measures. These have, in part, been adapted from Hawkins (1976).

(1) Cessation of glacial activity, which was prevalent during deposition of the majority of the Joe Joe Group, signalled a general warming of the climate. The contribution of aerially transported volcanic material also ceased. These two environmental changes in combination favoured the formation of peat swamps.

The lithology and stratigraphy within the Aramac Coal Measures suggest a swamp-dominated fluvial, possibly meandering stream, system. The presence of a deltaic setting as suggested by some authors, is doubtful considering the small aerial extent of and hence restricted data on the coal measures and lack of information on lateral facies changes.

Mid-Permian uplift and erosion truncated the Aramac Coal Measures, with erosion proceeding to stratigraphically lower levels in the Joe Joe Group.

(2) After planation, a peat swamp and fluvial environment was established once again, which prograded across the basin in the Late Permian.

The sedimentary lithologies and upwards-fining cycles, and the gradual increase in sulphur of the coals southward, suggest a prograding delta or large alluvial plain changing southwards into marine-influenced environments. Proximal alluvium flanked the basin in the north and east and passed laterally southwards into sediments of upper delta plain and transitional lower delta plain environments. Farther south, the transition to barrier and back-barrier sands may be represented by the Colinlea Sandstone.

This depositional model for the Late Permian Galilee Basin lacks identifiable lower delta plain shale, although it could be argued that the Black Alley Shale is representative of this facies.

Evans (1980) has also challenged this model, opining that the equivalent stratigraphic levels in the Denison Trough are also postulated to be deltaic, and thus it would appear very unlikely that such a large area would be subjected to a deltaic environment.

(3) The marine transgression of the Springsure Shelf and neighbouring parts of the Galilee Basin occurred in post-Colinlea Sandstone time. This sea-level rise had the effect of slowing down sedimentation on the shelf and was accompanied by a lowering of stream gradients.

The marine sediments of the Peawaddy Formation grade laterally into the upper part of the Colinlea Sandstone and the Black Alley Shale into the lower part of the Bandanna Formation. A westward progradation is indicated by the Peawaddy Formation extending farther west than the Ingelara marine transgression. In addition, the Mantuan *Productus* bed occurs at the top of the Peawaddy Formation in the Denison Trough, but some distance below the top of the unit on the Springsure Shelf (Gray, 1976).

(4) The last phase of Permian sedimentation was the eastward regression of the marine environment. A fluvio–deltaic plain was established and shale, sand and thin coals prograded across the Springsure Shelf.

The widely scattered data control does not allow a definitive depositional model to be constructed for the Galilee Basin and it is necessary to refer to existing models for comparison. In addition, because it is not possible to place the Late Permian Stage 5 sequence in a finer subdivision, the lithological temporal relationships are not certain. For the present, the deltaic model cannot be entirely ruled out until more detailed facies relationships are known.

The transition zone described from model studies elsewhere (for example Howell & Ferm, 1980; Horne & others, 1978) is similar to that of the widespread Permian coals of the northern Galilee Basin. These coals are thick, laterally continuous, and low in sulphur. The widespread coal at the top of the Bandanna Formation has

been correlated over many well sections. Other facies in the Galilee Basin can be correlated with this model in a similar manner.

It is tempting to extrapolate existing models still further, but there are insufficient details of the Galilee Basin to substantiate such precise subdivisions. One speculative model proposes an association of the Bandanna Formation, Colinlea Sandstone, Peawaddy Formation, and Black Alley Shale in a cross-section of a delta, ranging from upper delta plain, through lower delta plain and beach barrier to distal delta muds. Several regional and local regressions and transgressions could explain both vertical and lateral facies changes.
This model envisages:
(1) A transgression resulting in a beach-barrier in areas offshore from the Galilee Basin. The Galilee Basin hinterland at this stage consisted of two principal environments: a peripheral swamp-dominated meandering stream-setting passing laterally basinwards to the west and north into a braided stream-regime with predominantly channel sands.
(2) Further transgression with marine sediments accumulating on the Springsure Shelf and possibly delta plain with formation of sandstone, shale and coal, barrier sands, and distal shales.
(3) Regression of the marine influence and complementary progradation of an alluvial plain with the formation of widespread peat swamps. The deposits indicate a meandering stream system in a predominantly swamp-dominated terrain.

Conclusions

There is obviously a great deal of fundamental data still required in the Galilee Basin in order to obtain a clear understanding of the interplay between palaeotectonic and environmental history. The principal reason for the lack of sufficient information is the paucity of data control points in the basin. This means, it is impossible to assess environmental controls on the origin and quality of coals that may be expected and, in addition, lack of rigid control on the position of structure contours on the coal-bearing formations precludes the accurate assessment of the configuration, distribution and structure of the units containing the coal measures.

The Late Permian coal at the eastern margin has been explored regionally by widely spaced exploratory coal drilling. However, the western region, and western basin margins and the Lovelle Depression have insufficient data to assess coal continuity, quality and accessibility.

TABLE 10–5. WELL COMPLETION REPORTS–GALILEE BASIN

ALICE RIVER 1
R. HARE & ASSOCIATES, 1963–Alice River No. 1, well completion report, Queensland. *Farmout Drillers N.L., BMR File* 62/1134.

ALLANDALE 1
LESLIE, W.C., 1971–Allandale No. 1, well completion report. *Beaver Exploration Australia N.L. and Pexa Oil N.L., BMR File* 70/823.

ALVA NO. 1
HAMILTON, N.J., 1973–Alva No. 1 well completion report. *Hartogen Explorations Pty Ltd and Australian Aquitaine Petroleum Pty Ltd., BMR File* 72/2633.

ARAMAC 1, & HEXHAM 1
SWARBRICK, C.F.J., & WALLIN, C.I., 1976–QDM Aramac No. 1 and Hexham No. 1, well completion reports. *Geological Survey of Queensland, Report* 92.

BALFOUR 1
GERRARD, M.J., 1966–Amoseas Balfour No. 1, well completion report. *American Overseas Petroleum Ltd, BMR File* 66/42–02.

GARRETT, G.W., & PETERSEN, W.A., 1968b–ASOC Barcoo No.1, well completion report. *Australian Sun Oil Company Ltd., BMR File* 68/2026.

BERYL 1
MINES ADMINISTRATION PTY LIMITED, 1964–A.A.O.Beryl No. 1, well completion report. *Associated Australian Oilfields N.L., BMR File* 64/4050.

BIRKHEAD 1
EXON, N.F., GALLOWAY, M.C., CASEY, D.J., & KIRKEGAARD, A.G., 1972 – Geology of the Tambo/Augathella Area, Queensland. *Bureau of Mineral Resources, Australia, Report* 143.

BONNIE 1
KYRANIS, N., 1966–Phillips–Sunray Bonnie No. 1, well completion report. Phillips Australian Oil Company, BMR File 66/4201.

BOREE 1
GERRARD, M.J., 1964a–Boree No. 1, well completion report, Authority to Prospect 101P, Queensland. *American Overseas Petroleum Ltd, BMR File* 64/4046.

BROOKWOOD 1
PEMBERTON, R.L., 1962–Exoil Brookwood No. 1, well completion report. *Exoil No Liability, BMR File* 62/1122, and *PSSA publication* 32.

BUCKABIE NO. 1
KITSMAN, W.L., LEWIS, J.H., & ROWE, S.M., 1961–Phillips–Sunray Buckabie No. 1, well completion report. *Phillips Petroleum Company, BMR File* 62/1073.

BURY 1
PATTERSON, W.A., 1966–Phillips–Sunray, Bury No. 2, Queensland, well completion report. *Phillips Australian Oil Company, BMR File* 66/4192.

CARLOW 1
KYRANIS, N., 1966–Phillips–Sunray Carlow No. 1, well completion report. *Phillips Australian Oil Company, BMR File* 64/4120.

GSQ CHARTERS TOWERS 1
BALFE, P.E., 1980–Stratigraphic drilling report–GSQ Charters Towers No. 1. *Queensland Government Mining Journal*, 81 (949), 542–549.

CORFIELD 1
HARRIS, H.I., 1960–Corfield No. 1, Queensland, well completion report. *Magellan Petroleum Corp., BMR File* 62/1207.

CUNNO 1
GERRARD, M.J., 1966–Cunno No. 1, well completion report, Authority to prospect 101P, Queensland. *American Overseas Petroleum Ltd, BMR File* 66/4203.

DARTMOUTH NO.1
KNUTH, B.W., 1967–Phillips–Sunray Dartmouth No. 1, well completion report. *Phillips Australian Oil Co., Brisbane BMR File* 66/4216.

EASTWOOD 1
MINES ADMINISTRATION PTY LTD, 1970–A.A.O. Eastwood No. 1, well completion report. *Associated Australian Oilfields N.L., BMR File* 69/2024.

ETONVALE 1
LEWIS, J.H., & KYRANIS, N., 1962–Phillips–Sunray Etonvale No.1, well completion report. *Phillips Petroleum Company, BMR File* 62/1079.

FAIRLEA 1
GARRETT, G.W., & PETERSEN, W.A., 1968a–Sun Oil Fairlea No.1, well completion report. *Australian Sun Oil Co, Ltd., BMR File* 68/2010.

FOUR MILE BORE; REG. NO. 4171 (R4171)
VINE, R.R., CASEY, D.J., & JOHNSON, N.E.A., 1964–Progress report, 1963, on the geology of part of the north-eastern Eromanga Basin, Queensland. *Bureau of Mineral Resources, Australia, Record* 1964/39 *(unpublished)*.

GALILEE NS1, NS2
CARR, A.F., 1973–Galilee Basin, exploratory coal drilling–Wendouree area. *Geological Survey of Queensland, Record* 1973/12.

GALILEE NS5
CARR, A.F., 1973–Galilee Basin, exploratory coal drilling–Degulla area. *Geological Survey of Queensland, Record* 1973/19.

GALILEE NS8, 10
CARR, A.F., 1974–Galilee Basin exploratory coal drilling–Laglan area. *Geological Survey of Queensland, Record* 1974/12.

GALILEE NS15R
CARR, A.F., 1974–Galilee Basin, exploratory coal drilling–Lambton Meadows area. *Geological Survey of Queensland, Record* 1974/31.

GALILEE NS21
CARR, A.F., 1974–Galilee Basin, exploratory coal drilling–Moray Downs area. *Geological Survey of Queensland, Record* 1974/28.

GALILEE NS24
CARR, A.F., 1976–Galilee Basin, exploratory coal drilling–Mirtna area. *Geological Survey of Queensland, Record* 1976/4.

GALILEE NS29
CARR, A.F., 1977–Galilee Basin, exploratory coal drilling–View Hill area. *Geological Survey of Queensland, Record* 1977/11.

GALILEE NS33
CARR, A.F., 1978–Galilee Basin, exploratory coal drilling–Longton area. *Geological Survey of Queensland, Record* 1978/15.

TABLE 10–5. WELL COMPLETION REPORTS–GALILEE BASIN

GILMORE NO.1
LEWIS, J.H., & KYRANIS, N., 1965–Phillips–Sunray Gilmore No.1, well completion report. *Phillips Petroleum Company, BMR File* 64/4039.

GLENALVON or ROWEN LYNN No.2 BORE. REG. NO. 15530
EVANS, P.R., 1964–Some palynological observations on samples from the northeastern Eromanga Basin, central Queensland. *Bureau of Mineral Resources, Australia, Record* 1964/76.

GLENARAS 1
McDONAGH, G.P., 1967–Glenaras No. 1, well completion report. *Phillips Australia Oil Company, BMR File* 66/4221.

GOLEBURRA 1
WATSON, P.J., 1973–Goleburra No. 1, well completion report. *Hematite Petroleum Pty Ltd., BMR File* 72/2759.

GREY RANGE 1
PORTER, C.R., 1974–Grey Range No. 1, well completion report. *Hartogen Explorations Pty Ltd., BMR File* 74/215.

HEXHAM No. 1 (See Swarbrick & Wallin, 1976; ARAMAC No. 1)

GSQ HUGHENDEN 1–2R, 3–4R, 5, 6
GREY, A.R.G., 1977–Stratigraphic drilling in the Hughenden 1:250 000 Sheet area, 1974–75. *Queensland Government Mining Journal*, 78(910), 382–392.

GSQ HUGHENDEN 7
BALFE, P.E., 1979–Stratigraphic drilling report–GSQ Hughenden 7. *Queensland Government Mining Journal*, 80(932), 282–294.

HULTON NO.1
McTAGGART, N.R., 1964–Hulton No. 1 well completion report, A to P 87P, Queensland. *W.D. Mott & Associates for Longreach Oil Ltd, BMR File* 64/4059.

JERICHO 1
BENEDEK, S., 1965–Alliance Jericho No. 1 well completion report, Authority to Prospect 81P, Queensland. *Alliance Oil Development Australia N.L. (unpublished), BMR File* 65/4141.

GSQ JERICHO 1
SWARBRICK, C.F.J., 1974–Stratigraphic drilling report–G.S.Q. Jericho 1. *Queensland Government Mining Journal*, 75(872), 210–215.

GSQ JERICHO 2
WALLIN, C.I., 1975–Stratigraphic drilling report–G.S.Q.Jericho 2. *Queensland Government Mining Journal*, 76(890), 438–443.

GRAY, A.R.G., 1976–Stratigraphic relationships of Late Palaeozoic sediments between Springsure and Jericho. *Queensland Government Mining Journal*, 77, 146–163.

GRAY, A.R.G., & SWARBRICK, C.F.J., 1975–Nomenclature of Late Palaeozoic strata in the northeastern Galilee Basin. *Queensland Government Mining Journal*, 76, 344–352.

KOBURRA 1
PEMBERTON, R.L., & Le GAY BRERETON, J., 1970–Koburra No. 1, well completion report, Queensland. *Flinders Petroleum No Liability (Exoil N.L. and Transoil N.L.–tenement holders) (unpublished), BMR File* 70/453.

LAKE GALILEE 1
PEMBERTON, R.L., 1965–ENL Lake Galilee No. 1, well completion report. *Exoil No Liability, Transoil No Liability, (unpublished), BMR File* 64/4076.

LAKE GALILEE 1
PEMBERTON, R.L., 1964–ENL Lake Galilee No. 1, well completion report. *Exoil No Liability, Transoil No Liability, (unpublished), BMR File* 64/4076.

LEOPARDWOOD 1
McDONAGH, G., KNUTH, B.W., & PATTERSON, W.A., 1966–Phillips–Sunray Leopardwood No. 1, well completion report. *Phillips Australian Oil Company, (unpublished), BMR File* 65/4181.

LOVELLE DOWNS 1
WATSON, P.J., 1973–Lovelle Downs No. 1, well completion report. *Hematite Petroleum Pty Ltd. (unpublished), BMR File* 72/2669.

MARANDA 1
Le BLANC, M.C., 1963–Maranda No. 1 final well report. *Queensland Oil Development N.L. (unpublished), BMR File* 62/1119.

MARCHMONT 1
W.D. MOTT & ASSOCIATES, 1964–Marchmont No. 1 well completion report, A to P 87P, Queensland. *Longreach Oil Ltd. (unpublished), BMR File* 64/4062.

MUTTABURRA 1
MEYERS, N.A., & SPENCER, L., 1970–Pursuit Muttaburra No.1, well completion report. *Pursuit Oil N.L., BMR File* 69/243.

OOROONOO 1
PSSA, 1963–Conorada Ooroonoo 1, Queensland, Conorada Petroleum Corporation. *Bureau of Mineral Resources, Australia, Petroleum Search Subsidy Acts Publication* 23.

RAND No. 1
WARRIS, B.J., 1969–Rand No. 1, well completion report. *Data Analysis Pty Ltd for Longreach Oil Ltd, BMR File* 69/2009.

RAVENSBOURNE 1
SIROVS, M.G., 1968–Ravensbourne No. 1, well completion report. *American Overseas Petroleum Ltd., BMR File* 68/2027.

ROWEN LYNN NO.2 BORE or GLENALVON REG. NO. 15530
VINE, R.R., 1970–Richmond, Queensland, 1:250 000 geological series, Sheet SF/54–4, Explanatory Notes. *Bureau of Mineral Resources, Australia.*

GSQ SPRINGSURE 11, 12, 13
GRAY, A.R.G., 1976–Stratigraphic relationships of Late Palaeozoic sediments between Springsure and Jericho. *Queensland Government Mining Journal*, 77, 147–163.

STAFFORD 1
NETZEL, R.K., 1967–Phillips–Sunray Stafford No. 1, well completion report. *Phillips Australian Oil Company, BMR File* 66/4208.

GSQ TAMBO 1–1A
WALLIN, C.I., 1975–Stratigraphic drilling report–GSQ Tambo 1–1A. *Queensland Government Mining Journal*, 76, 411–415.

GSQ TAMBO 3
GSQ CLAUDE NS1, 2
GSQ BUCKLAND NS1, 2, 3
ANDERSON, J.C., 1974–Departmental drilling, Springsure Shelf programme, western Bowen Basin. *Geological Survey of Queensland Record* 1974/37 *(unpublished).*

THUNDERBOLT 1
AMERADA PETROLEUM CORP. AUST. LTD., 1967–Amerada Thunderbolt No. 1, well completion report, limited. *Exoil NL & Transoil NL–Tenement holder (unpublished), BMR File* 67/4245.

TOWERHILL 1
AMOCO AUSTRALIA EXPLORATION CO., 1968–AAE Towerhill No. 1, well completion report. *BMR File* 67/4271.

TOWERHILL A-1
AMOCO AUSTRALIA EXPLORATION CO., 1968–AAE Towerhill A-1, well completion report. *BMR File* 67/4271.

VALETTA 1
LESLIE, W.C., 1970–Valetta No. 1, well completion report. *Beaver Exploration Australia N.L., Pexa Oil N.L., BMR File* 70/264.

WESTBOURNE 1
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WESTON 1
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CHAPTER 11

Late Permian Gidgealpa Group, Cooper Basin of South Australia and Queensland

by
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Introduction

The Cooper Basin is a northeasterly trending intra-cratonic basin beneath the Mesozoic Eromanga Basin and extends over about 127 000 km^2 from the southwest of Queensland to the northeast of South Australia (Plates 1 and 17). No part of the basin is exposed. Permian coals are significant hydrocarbon sources, but are as yet unexploited for coal as they are buried too deeply.

The Cooper Basin has a thin sequence of Late Carboniferous–Early Permian and Triassic sediments, which were deposited in fluvial, deltaic and lacustrine environments. The relationships between facies and basin structures were probably controlled by slight differential subsidence in various parts of the basin as well as by changes in climate and sediment supply.

Previous Work

As the Cooper Basin contains important gas fields, much has been written about it. Most publications have dealt with the southwestern half of the basin because of the major gas fields and this is therefore better known. Papalia (1969) and Gatehouse (1972) outlined the Permian and Triassic stratigraphy, and Battersby (1976) reviewed the geology of the basin and described the hydrocarbon fields. Sedimentological studies of Permian sediments in the southern Cooper Basin were published by Stuart (1976), and Thornton (1973, 1978, 1979), and Schwebel & others (1980) presented coal isopach and isoleth maps.

In contrast to the southern Cooper Basin, the northern part has received little attention and few wells have been drilled. Senior (1975) discussed the data then available, and Pinchin & Senior (1982) and Wake-Dyster (1982) the Bureau of Mineral Resources seismic data.

The present study does not try to emulate the works listed above because most of them were based on detailed examination of core, cuttings and wireline logs over some years. Therefore, this chapter is a review of the literature from which some inferences on the distribution and origin of Cooper Basin coals are drawn. The structure contour and isopach maps are based on the heights of formation tops supplied by the South Australian Geological Survey and exploration companies, except for some wells in the northern Cooper Basin for which well logs were available for re-interpretation.

Structural Subdivisions

The Cooper Basin has two domains where structural trends and stratigraphy are different — they are usually referred to as the northern and southern parts of the Cooper Basin, which are separated by a west-northwest trending structural high, the Karmona Trend (Plates 2, 21 and 22; and Battersby, 1976).

The major structures in the south Cooper Basin are three northeasterly–southwesterly trending troughs separated by narrower ridges with similar trend. From south to north, the major troughs in the south Cooper Basin are the Tennapera Trough, the Nappamerri Trough, and the Patchawarra Trough. The Tennapera and Nappamerri Troughs are separated by the Murteree–Nappacoongee Trend, whereas the Nappamerri and Patchawarra Troughs are separated by the Gidgealpa–Merrimelia–Innamincka Trend. A number of smaller folds with the same orientation are present in the troughs and on the structural highs (Stuart, 1976). This northeast-trending pattern is complicated by north to north-northeast trending structures, of which the Toolachee Trend is the most prominent (Plate 2), and by east-northeast oriented structures, with the Tickalara, Wolgolla and Karmona Trends being the most important (Plate 2).

North of the Karmona Trend, the major structures trend north-northwesterly, northerly, and north-northeasterly. From west to east, the major structural elements in the northern Cooper Basin are the Arrabury Trough, Yamma Yamma Trough, Cooper Syncline, Mount Howitt Trend, Thomson Syncline, and the Chandos Trend (Plate 2). The northern Cooper Basin is separated from the Galilee Basin by the Canaway Fault (Plate 2).

The anticlinal trends in the Cooper Basin are the result of sediments draping over low basement fault blocks, controlled by some fault movement during deposition. Most faults are steep normal faults (Stuart, 1976). Timing of fault movements and the role of the major structures influencing sedimentation will be discussed after the stratigraphy.

Stratigraphy

Basement

The Cooper Basin is a Permian and Triassic feature resting on older Palaeozoic rocks and overlain unconformably by the Jurassic and younger rocks of the Eromanga Basin. Schwebel & others

(1980) presented a map of basement lithologies beneath the southern Cooper Basin derived from drilling results (Fig. 11–1). They showed that most of the southern Cooper Basin rests on Ordovician sandstones and shales with some areas resting on Carboniferous granite, Cambrian sediments and volcanics, and Devonian red beds. The distribution of basement rock types beneath the northern Cooper Basin is not as clear because few petroleum wells have been drilled in that part of the basin, but those which penetrated basement encountered similar rock types, below the Devonian rocks of the Adavale Basin (Auchincloss, 1976; Pinchin & Senior, 1982).

Biostratigraphy

The Permian rocks of the Cooper Basin formed in fluvial to lacustrine environments and are subdivided using the palynological stages of Kemp & others (1977) (Fig. 11–2). All these stages are present in the Permian section, though there are several significant time breaks even in relatively complete sections (Kemp & others, 1977). For example no assemblage corresponding to Upper Stage 5a has been found, suggesting a substantial break between the Daralingie beds and the Toolachee Formation (Fig. 11–2; Kemp & others, 1977).

Thornton (1978, 1979) used palynological data and well correlations to show that formation boundaries in the Gidgealpa Group are diachronous, reflecting the migration of environments across the basin.

Gidgealpa Group

Tirrawarra Sandstone

Age. This sandstone contains Stage 2 and Stage 3 microfloras and is therefore latest Carboniferous or early Permian.

Lithology. Mainly fine to medium-grained quartz sandstone with minor shales and coals.

Thickness. Up to 156 m.

Distribution. The Tirrawarra Sandstone is present throughout the Patchawarra Trough and in parts of both the Nappamerri and Tennapera Troughs. It also occurs on the Gidgealpa–Merrimelia–Innamincka Anticlinal Trend, the Murteree Trend, and the Big Lake Anticline. It is absent from the southeastern edges of the Cooper Basin and the entire northern Cooper Basin.

Contacts. The Tirrawarra Sandstone overlies the Merrimelia Formation in all but a few wells in the Patchawarra Trough (Battersby, 1976).

Depositional environment. The Tirrawarra Sandstone originated as a sandy, braided-stream system which was supplied from the east (Thornton, 1979).

Palaeogeography and tectonism. The Gidgealpa–Merrimelia–Innamincka Trend is covered by a relatively thick layer of Tirrawarra Sandstone in many places which suggests that the trend was not a positive feature.

Correlations. The Tirrawarra Sandstone is equivalent to the Jochmus Formation in the Galilee Basin and to the lower parts of the Reids Dome beds in the Bowen Basin.

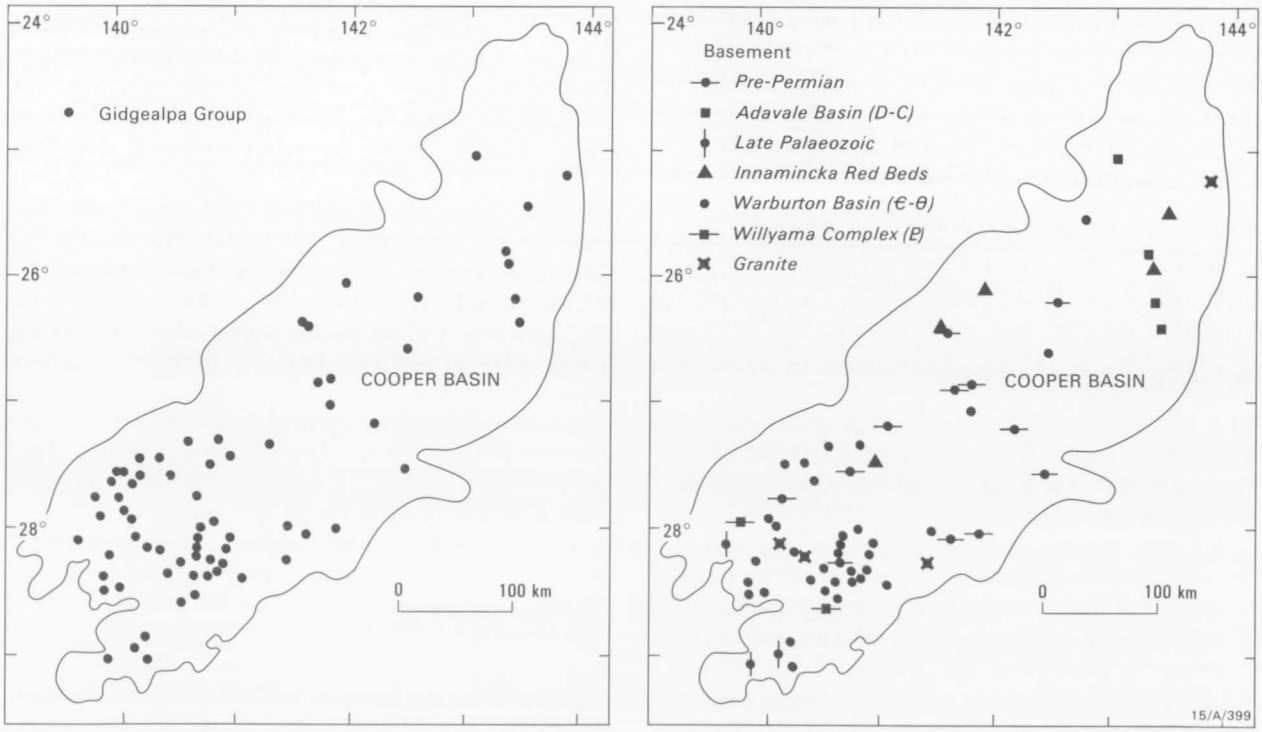

Fig. 11–1. Distribution of basement types and the Gidgealpa Group from well intersections.

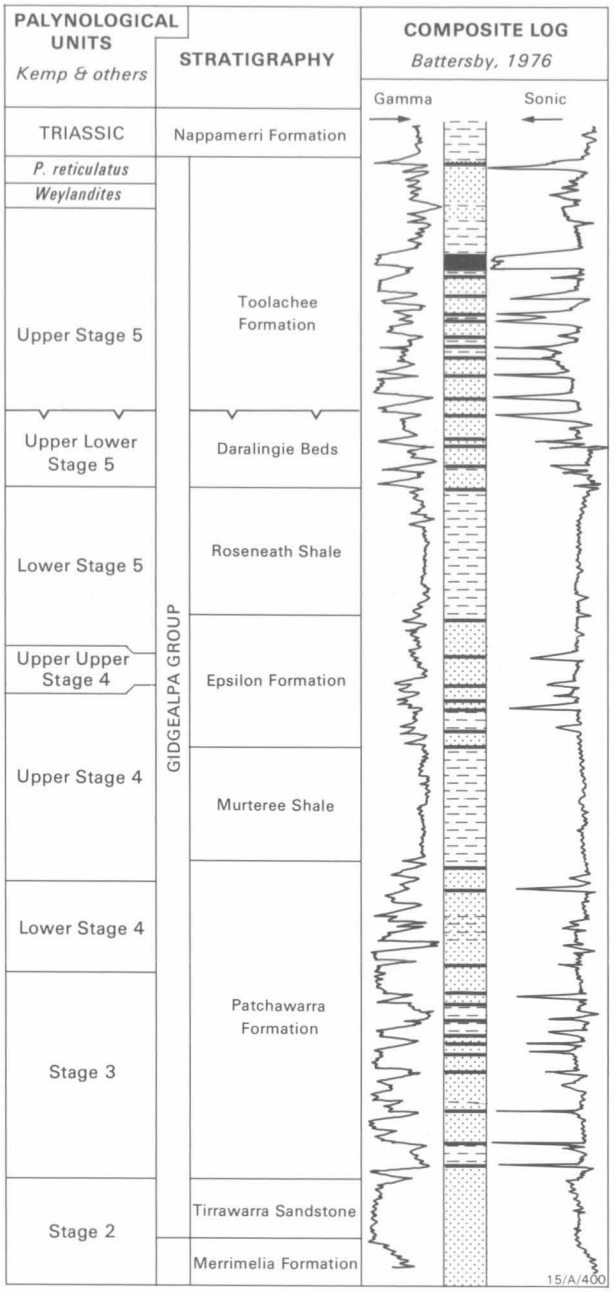

Fig. 11–2. Stratigraphy of the Cooper Basin.

Patchawarra Formation

Age. The Patchawarra Formation has Stage 3 microfloras at the base and Upper Stage 4 microfloras at the top.

Lithology. Sandstones, mudstones and coals make up the Patchawarra Formation. Thornton (1979) showed that the proportion of the different rock types varies with structural setting and time. Sandstones form the greatest proportion in a belt running from the southern end of the Tennapera Trough northwards across the Murteree–Nappacoongee trend to the southwestern end of the Nappamerri Trough. The belt then trends towards the northeast, along the axis of the Nappamerri Trough. Shales and coals predominate in sections on the southeastern flank of the basin and in the Patchawarra Trough. In the Patchawarra Trough, Kapel (1972) recognised three lithologic units. The lower unit is carbonaceous shale with thin coal seams and sandstone, and with thick sandstone intervals at the base in some places. The middle unit is thickly interbedded sandstone, shale, and coal seams up to 25 m thick, and the uppermost unit is mostly shale. Thornton (1979) showed that the Patchawarra Formation throughout the southern Cooper Basin has increased shale near the top.

Thickness. Exploration wells have penetrated up to 700 m of Patchawarra Formation in the Nappamerri Trough (Schwebel & others, 1980) and thicknesses of the order of 900 m are probably present in the deepest parts of the Nappamerri Trough (Fig. 11–5). The Patchawarra Formation thins onto the margins of the southern Cooper Basin and across the Gidgealpa–Merrimelia–Innamincka Trend, with thicknesses changing across many of the faults along this trend. Both onlap and late Permian erosion caused the thinning of the Patchawarra Formation on the basin margins and on some of the major structures. In the northern Cooper Basin, however, the Patchawarra Formation is thin and discontinuous. Wells have penetrated up to 114 m of Patchawarra Formation on the northern flank of the Karmona Trend, but wells in the northeastern end of the Basin have condensed sequences of Gidgealpa Group or Toolachee Formation only. Truncated or condensed deposits might be expected in most of the wells because they are located on anticlinal crests, although seismic sections across the deeper parts of the northern Cooper Basin (Pinchin & Senior, 1982; Wake-Dyster, 1982; Wake-Dyster & Pinchin, 1981) reveal relatively thin Gidgealpa Group sediments.

Distribution. The Patchawarra Formation is found throughout the southern Cooper Basin (Fig. 11–3), except where it has been eroded off a few anticlinal crests. In the northern Cooper Basin, the Patchawarra Formation is recognisable in only six out of eighteen wells, possibly because it was either not deposited or was eroded before deposition of the Toolachee Formation or because the entire Gidgealpa Group is represented by a thin sequence.

Contacts. The Patchawarra Formation conformably overlies the Tirrawarra Sandstone. Thornton (1979) showed that the boundary is diachronous, becoming younger towards the east. The Patchawarra Formation overlaps the Tirrawarra Sandstone on the basin edges and on some of the anticlines.

Environment. The Patchawarra Formation was formed by meandering streams with the sandstone bodies deposited by channel belts, and the shales and coals on overbank flood plains (Thornton, 1979). The uppermost, more shaly unit of the Patchawarra Formation probably originated in a

deltaic to lacustrine environment (Stuart, 1976; Thornton, 1979).

Tectonism. Thickness changes along the Gidgealpa–Merrimelia–Innamincka Trend demonstrate fault movement during deposition. The concentration of channel-belt sandstones in the Nappamerri Trough indicates that this trough subsided slightly faster than adjacent areas, thus concentrating the stream drainage (cf. Read & Dean, 1982), whereas the abundance of shale and coal in the Patchawarra Trough suggests slower subsidence. The northern Cooper Basin also underwent slow subsidence.

Correlations. The Aramac Coal Measures and the Reids Dome beds are equivalent to the lower part of the Patchawarra Formation, whereas the Tiverton Subgroup in the Bowen Basin is equivalent to the upper part of the Patchawarra Formation.

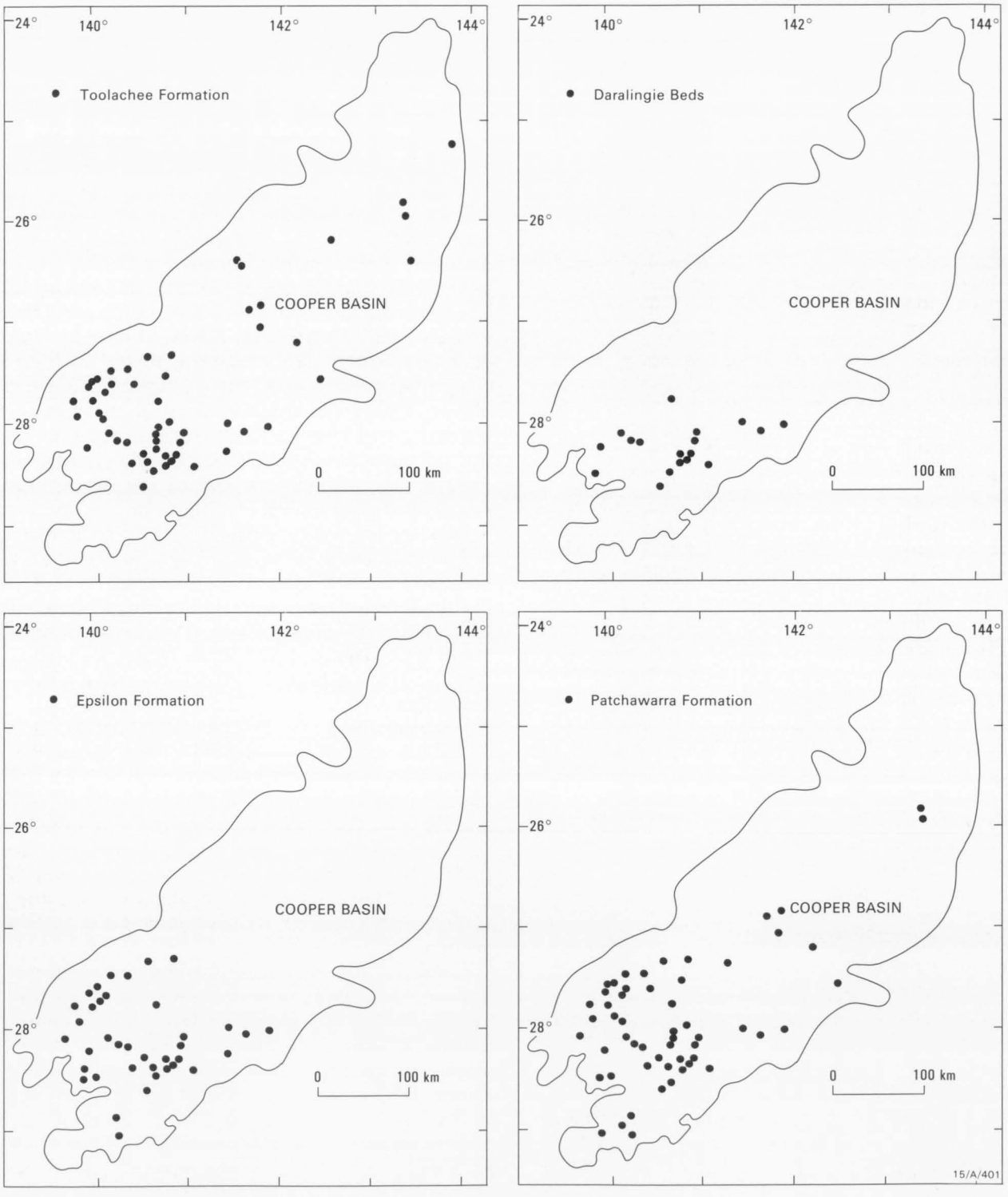

Fig. 11–3. Distribution of the Patchawarra and Epsilon Formations, Daralingie Beds and Toolachee Formation from well intersections.

Murteree Shale

Age. The Murteree Shale contains an Upper Stage 4 microflora.

Lithology: The Murteree Shale is a uniform blanket of carbonaceous shales and siltstones.

Thickness. The Murteree Shale is a relatively thin unit. The thickest section encountered so far is 88 m, though 100 m may be present in the Nappamerri Trough (Thornton, 1979). Battersby (1976) estimates an average thickness of 45 m. It is thinner in the Patchawarra Trough than in the rest of the southern Cooper Basin.

Distribution. The Murteree Shale forms a blanket of relatively uniform thickness across the southern Cooper Basin. It was eroded from parts of the Gidgealpa–Merrimelia–Innamincka, Murteree–Nappacoongee and Toolachee Trends, but usually shows only slight thinning across these structures. It is absent from the northern Cooper Basin.

Contacts. The Murteree Shale overlies the Patchawarra Formation with a conformable, diachronous boundary.

Environments. The Murteree Shale probably accumulated in an extensive lake or shallow arm of the sea which transgressed from the northeast, according to Thornton (1979) and Stuart (1976). The upper shaly part of the Patchawarra Formation is a deltaic and shoreline deposit, which accumulated during this transgression. The water body was probably a lake that formed when the northeasterly flowing rivers were ponded against the Karmona Trend and within the Yamma Yamma Trough, during a period when subsidence of the southwestern Cooper Basin slightly exceeded sediment supply.

Tectonism. Subsidence of the southern Cooper Basin was relatively uniform during deposition of the Murteree Shale though somewhat slower in the Patchawarra Trough than in the rest of the Basin. Thornton (1979) suggested that the sea or lake transgressed across the Cooper Basin from the northeast and therefore it must have covered at least part of the northern Cooper Basin, and that any sediment formed was then stripped off before the Toolachee Formation originated. If these sediments accumulated in a structurally controlled lake, however, deposition was confined to both the southwestern Cooper Basin and the Yamma–Yamma Trough.

Correlation. There are no equivalents of the Murteree Shale in the Galilee Basin. Thornton (1979) suggests, on palynological evidence, that the Murteree Shale correlates with the lower part of the Gebbie Subgroup in the Denison Trough.

Epsilon Formation

Age. The Epsilon Formation has an Upper Stage 4 microflora on the eastern side of the southern Cooper Basin, but becomes younger to the west so that it contains a lower Stage 5 microflora to the west.

Lithology. The Epsilon Formation comprises interbedded siltstone, shale, sandstone, and coal. Coal is abundant on the western side of the southern Cooper Basin, but absent in the east.

Thickness. The Epsilon Formation is 138 m in the thickest section penetrated, which is in the Nappamerri Trough, but averages about 60 m through most of the Basin. In the Patchawarra Trough it averages about 30 m thick.

Distribution. The Epsilon Formation is absent from the crests of the Gidgealpa–Merrimelia–Innamincka–Murteree–Napacoongie and Toolachee anticlines and from the northern Cooper Basin (Fig. 11–3).

Contacts. The Epsilon Formation overlies the Murteree Shale with a conformable boundary that becomes younger to the west.

Environment. The Epsilon Formation consists of deltaic and strandline facies deposited during a regression of the lake in which the Murteree Shale accumulated, followed by a renewed transgression from the northeast that resulted in the origin of the Roseneath Shale. Rivers flowed into the basin from the southwest.

Tectonism. The thickness changes and the facies distribution in the Epsilon Formation suggest that subsidence was more rapid in the eastern part of the southern Cooper Basin than in the western part (Thornton, 1979).

Correlations. The Epsilon Formation's microflora indicates that it correlates with part of the Gebbie Subgroup of the Bowen Basin.

Roseneath Shale

Age. The Roseneath Shale contains a Lower Stage 5 microflora over most of the basin, but in some of its lower parts in the eastern part of the southern Cooper Basin has Upper Stage 4 palynomorphs.

Lithology. The Roseneath Shale consist of grey carbonaceous shale and siltstone.

Thickness. The Roseneath Shale is thickest in the eastern part of the southern Cooper Basin, attaining a maximum thickness of 88 m in the Tennapera Trough. The Roseneath Shale thins significantly on the flanks of the major anticlines.

Distribution. The Roseneath Shale is absent from the northern Cooper Basin and has been found in only one well in the Patchawarra Trough. It is also absent from the crests of the Murteree–Nappacoongee and the Gidgealpa–Merrimelia–Innamincka anticlinal trends.

Contacts. The boundary between the Epsilon Formation and the Roseneath Shale is conformable and diachronous, becoming younger from east to west.

Environments. The Roseneath Shale was deposited in a large lake, very similar to that in which the Murteree Shale formed.

Tectonism. Subsidence was fairly uniform across the southern Cooper Basin, except for the Patchawarra Trough which subsided more slowly than the rest.

Correlations. The Roseneath Shale correlates with part of the Colinlea Sandstone in the Galilee Basin and with part of Gebbie Subgroup in the Bowen Basin.

Daralingie beds

Age. These beds have a Lower Stage 5 microflora.

Lithology. The Daralingie beds consist of shale and siltstone with thin beds of sandstone and coal. Gamma-ray logs of the sandstone beds show that these beds become coarser from bottom to top (Battersby, 1976). Coal is concentrated in four small areas in the Nappamerri and Tennapera Troughs.

Thickness. The Daralingie beds are mostly less than 30 m thick, but up to 90 m has been penetrated in the Nappamerri Trough.

Distribution. These beds are confined to the deeper sections of the Nappamerri and Tennapera Troughs.

Contacts. The boundary between the Daralingie beds and the underlying Roseneath Shale is conformable and diachronous.

Environments. The Daralingie beds were deposited as deltaic and shoreline facies during regression of the lake when the Roseneath Shale formed. Thornton (1979) showed that the shoreline regressed from the southwest and suggested that coal concentrated in deltaic sediments.

Tectonism. The Nappamerri and Tennapera Troughs continued to subside, but because the upper boundary of the Daralingie beds is a disconformity, it is not clear whether they were removed by erosion from the Patchawarra Trough or never formed.

Correlations. The microfloras in the Daralingie beds suggest correlation with the Colinlea Sandstone of the Galilee Basin and the Gebbie Subgroup of the Bowen Basin.

Toolachee Formation

Age. Most of the Toolachee Formation has an Upper Stage 5 microflora, but the uppermost parts in some restricted areas contain the Late Permian *Protohaploxypinus reticulatus* Zone and the *Weylandites* Zone (Kemp & others, 1977). Therefore, there is a significant hiatus between the Daralingie beds and the Toolachee Formation.

Lithology. The Toolachee Formation consists of a lower unit dominated by sandstone and an upper unit of carbonaceous shale with interbedded sandstone and coal.

Thickness. The Toolachee Formation is over 180 m thick in the deeper parts of the Nappamerri Trough and forms a fairly continuous blanket across the southern Cooper Basin, though it is thinner in the Patchawarra Trough than in the others. Where recognisable in the northern Cooper Basin, it averages about 50 m thick except in the Yamma Yamma Trough, where it is more than 300 m thick.

Distribution. The Toolachee Formation is present over most of the southern Cooper Basin, overlapping older formations on the Basin edges and on major anticlines (Fig. 11–3). It covers the major anticlines except for a few places where it pinches out against the structure's flanks and is overlapped by the Nappamerri Formation. Because of the small number of wells drilled in the northern Cooper Basin, the distribution of the Toolachee Formation is not clear. The impression is of a thin, continuous Toolachee Formation, thinning on the flanks of the anticlines and pinching out in some places.

Contacts. The Toolachee Formation overlies the Daralingie beds disconformably. Significant erosion took place throughout the basin prior to accumulation of the Toolachee Formation, so that it overlaps all older formations and the crest of some structures.

Environment. The lower part of the Toolachee Formation consists of fluvial channels facies. In the upper unit, overbank sediments become more important. Thornton (1979) recognised fining-up cycles in sandstones suggestive of deposition by meandering streams. Channel sandstones are more widespread along the axes of the Nappamerri and Patchawarra Troughs, whereas coals are more common along their flanks.

Tectonism. The disconformity at the base of the Toolachee Formation indicates a period of uplift and erosion before renewed subsidence allowed deposition of the Toolachee Formation. This subsidence was fairly uniform across the southern Cooper Basin, though the Patchawarra and Nappamerri Troughs sank slightly faster than the rest of the basin, permitting a fluvial environment to be established.

Correlations. The Toolachee Formation correlates with the upper part of the Colinlea Sandstone and the Bandanna Formation in the Galilee Basin, as well as with the Blenheim Subgroup and the Blackwater Group of the Bowen Basin.

Nappamerri Formation

Age. This formation ranges from latest Permian at the base to Late Triassic at the top (Youngs & Boothby, 1982).

Lithology. The Nappamerri Formation consists of grey to red-brown shale, siltstone, and sandstone. Parts of it have been termed "red-beds" (Battersby, 1976). The proportion of sandstone is greater in the northern Cooper Basin than in the southern half of the Basin.

Thickness. The Nappamerri Formation constitutes a blanket 100 m to 300 m thick across most of the Cooper Basin, with a maximum of 500 m. In the northern Cooper Basin, it is usually thicker than the entire Gidgealpa Group.

Distribution. The formation covers both northern and southern parts of the Cooper Basin and overlaps the Basin edges and most anticlinal crests. It is absent from the Murteree Anticline, probably because of non-deposition (Battersby, 1976).

Contacts. The Nappamerri Formation has a conformable boundary with the underlying Toolachee Formation and is unconformably overlain by Eromanga Basin sediments.

Environments. The formation was probably deposited in fluvial and lacustrine settings. Its lack of carbonaceous matter, and the red-bed parts, suggest a change to a drier climate compared to that existing during origin of the Toolachee Formation.

Tectonism. Subsidence was probably uniform across the Cooper Basin, though slightly faster in the northern part, so that streams concentrated there, depositing more sandy facies than in the southern part. Battersby (1976) considered that post-Triassic uplift caused the thinning of the Nappamerri Formation across major anticlines in the southern Cooper Basin.

Correlations. The Nappamerri Formation correlates with the Rewan Group in the Galilee and Bowen Basins.

Structure Contours and Isopachs

Structure contours* were compiled for five lithostratigraphic horizons in the Cooper Basin: the upper and lower boundaries of the Patchawarra Formation (Plates 4 and 5) and the Toolachee Formation (Plates 9 and 12), and of the base of the Epsilon Formation (Plate 6). These formations were selected for contouring as they include the principal coal-bearing formations. Isopachs were constructed for the Patchawarra Formation (Fig. 11–5), Toolachee Formation (Plate 12), Gidgealpa Group (Fig. 11–4), and for the interval composed of the Daralingie beds, Roseneath Shale, and Epsilon Formations (Plate 8).

Primary control on the value and position of the structure contours and isopachs is derived from petroleum exploration well data. The well completion reports are indexed in Table 11–1 and are cross-referenced to their control point numbers in Table 11–2. Assuming an area for the Cooper Basin of 118 800 km^2, there is, on the average, one control point for every 1650 km^2. The distribution of the control points is very uneven, with the largest number concentrated in the southern part of the Cooper Basin. The control point density in the northern part is much lower, and in the central Cooper Basin one control point is present in about every 11 000 km^2. Conversely, in the southern Cooper Basin, the density is as high as one control point to every 600 km^2.

The configuration of structure contours between the data points is controlled by regional seismic structure contour maps produced by the South Australian Department of Mines. Three prominent seismic reflection horizons have been mapped. The shallowest is seismic horizon 'C' compiled by Stadter & Townsend (1972) which is interpreted as originating in the Cretaceous Cadna-owie Formation. The structural datum for the intermediate 'P' horizon of the seismic structure contour map, compiled by Thornton & Youngs (1972), is interpreted as the base of the Mesozoic Eromanga Basin sequence, corresponding over most of the Cooper Basin to the top of the Gidgealpa Group. The 'P' seismic structure contour map was used as the basis for drawing the structure contours on the upper and lower boundaries of the later Permian Toolachee Formation, i.e., the youngest one in the Gidgealpa Group.

The 'Z' structure contour map, compiled by Moroney & Ramakrishna (1972), is interpreted as having a structural datum on the pre-Permian unconformity surface. This seismic structure contour plan was used to draw structure contours on the upper and lower boundaries of the Patchawarra Formation.

Isopachs for the Toolachee and Patchawarra Formations and the Gidgealpa Group were constructed using well thicknesses at control points, and values interpolated from structure contour intersections for the upper and lower formation boundaries. Isopachs from the intersection of seismic structure contours were smoothed where necessary.

* All elevations are given in metres below mean sea level.

TABLE 11–1. WELL COMPLETION REPORTS–COOPER BASIN

BODALLA 1
BUCHAN, S.J., 1968–BP Petroleum Development Australia, Bodella No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 67/4267.

BROLGA 1
WOOLDRIDGE, P., 1972–Delhi–Santos–Vamgas–Bridge–Reef–Basin Brolga No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 72/1018.

BRUMBY 1
LUNT, C.K., 1972–Delhi–Santos–Vamgas Brumby No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 72/939.

BUDGERYGAR 1
CADART, M.L. 1969–Alliance Budgerygar No. 1 well completion report. *Bureau of Mineral Resources, Australia, File* 68/2051.

BURKE 1
WILTSHIRE, M.J., 1972–Delhi–Santos–Vamgas Burke No. 1, well completion report. *Bureau of Mineral Resources, Australia File* 72/2728.

CANAWAY 1
ALLIANCE OIL DEVELOPMENT, 1963–Alliance Canaway No. 1, well completion report. *Bureau of Mineral Resources, Australia File* 53/1018.

CHANDOS 1
LAING, A.C.M., & BENEDEK, S., 1966–Alliance Chandos No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 66/4189.

CHANDOS SOUTH 1
LAING, A.C.M., & CADART, M.C., 1970–Alliance Chandos South No.1, well completion report. *Bureau of Mineral Resources, Australia, File* 69/2025.

CUMBROO 1
CAMPE, G.C., 1968–Alliance Cumbroo No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 68/2043.

DURHAM DOWNS 1
WILTSHIRE, M.J., 1972–Delhi–Santos–Vamgas–Flinders Petroleum–Western Mining Corp. Durham Downs No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 73/229.

GIDGEALPA 1
HARRISON, J., & HIGGINBOTHAM, G.T., 1964–Delhi–Santos Gidgealpa No.1, well completion report. *Bureau of Mineral Resources, Australia, File* 63/1029.

GILPEPPEE 1
MULREADY, J.N., 1970–Alliance Gilpeppee No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 69/2040.

INNAMINCKA 1
RYAN, J.C., 1961–Innamincka No. 1 well, South Australia, of Delhi–Frome–Santos. *Bureau of Mineral Resources, Australia Petroleum Search subsidy acts Publication* 9.

KANOWANA 1
WOOLDRIDGE, P., 1973–Vamgas–Santos–Delhi–Pexa–Endeavour Kanowana No. 1, well completion report. *Bureau of Mineral resources, Australia, File* 72/3282.

KUMBARIE 1
CASEY, D.J., 1970–Pexa Oil N.L. Kumbarie No. 1, well completion report. *Bureau of Mineral Resources, Australia File* 70/365.

MT HOWITT 1
DELHI AUSTRALIAN PETROLEUM LTD, 1966–Delhi–Santos Mt Howitt No. 1, well completion report. *Bureau of Mineral Resources, Australia File* 66/4195.

MURTEREE C-1
LUNT, C.K., 1972–Delhi–Santos–Pursuit–Vamgas Murteree C–1, well completion report. *Bureau of Mineral Resources, Australia, File* 72/2921.

ORIENTOS 1
HARRISON, J., GREER, W.J., & HIGGINBOTHAM, G.T., 1963–Delhi– Santos Orientos No.1, well completion report. *Bureau of Mineral Resources, Australia, File* 62/1118.

PACKSADDLE 1
MULREADY, J.N., 1970–Alliance Packsaddle No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 70/270.

TALLALIA 1
PEMBERTON, R.L., & LE GAY BRERETON, J., 1971–Flinders Petroleum Tallalia No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 70/305.

THUNDA 1
CADART, M., 1968–Alliance Thunda No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 68/2023.

TICKALARA 1
SWEENEY, P.J., JACQUE, M., & TRICOT, P., 1968–Total Exploration Australia Tickalara No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 68/2042.

TINGA TINGANA 1
DELHI AUSTRALIAN PETROLEUM LTD, 1968–Delhi–Santos Tinga Tingana No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 68/2000.

TOOLACHEE EAST 1
LUNT, C.K., 1972–Delhi–Santos–Vamgas Toolachee East No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 72/2643.

WEENA 1
BOWERING, O.J.W., 1970–Pexa Weena No. 1, well completion report. *Bureau of Mineral Resources, Austrtalia, File* 70/485.

YANPURRA 1
LE GAY BRERETON, J., 1971–Flinders Yanpurra No. 1, well completion report. *Bureau of Mineral Resources, Australia, File* 70/758.

TABLE 11–2–COOPER BASIN CONTROL POINTS

Reference No	*Control Point Name*
C 1	CO BARCOO JUNCTION 1
C 2	AOD BUDGERYGAR 1
C 3	AOD HUNDA 1
C 4	DPP INGELLA 1
C 5	AOD CHANDOS 1
C 6	AOD CHANDOS SOUTH 1
C 7	AOD CUMBROO 1
C 8	BPP BODALLA 1
C 9	DSL MT HOWITT 1
C10	DPP ALKINA 1
C11	AAP TANBAR 1
C12	AOD GILPEPPEE 1
C13	DPP GILPEPPEE 2
C14	DPP BARROLKA EAST 1
C15	AAP BARROLKA 1
C16	DSL DURHAM DOWNS 1
C17	DPP TARTULLA 1
C18	DPP JACKSON 1
C19	FPN ARRABURY 1
C20	FPN TALLALIA 1
C21	FPN YANPURRA 1
C22	DAP INNAMINCKA 1
C23	APA PACKSADDLE 1
C24	DPP WIMMA 1
C25	DIO KUDRIEKE 1

Table 11–2, continued

Reference No	*Control Point Name*
C26	FPN COONATIE 1
C27	DPP WANTANA 1
C28	DIO BURLEY 1
C29	DIO BROLGA 1
C30	SL FLY LAKE 4
C31	DIO FLY LAKE 3
C32	DIO TIRRAWARRA 10
C33	DIO TIRRAWARRA 5
C34	DPP MERRIMELIA 7
C35	VNL KANOWANA 1
C36	DPP WELCOME LAKE 1
C37	DPP JACK LAKE 1
C38	DSL GIDGEALPA 6
C39	DSL GIDGEALPA 1
C40	MON LAKE HOPE 1
C41	PEXA WIRRARIE 1
C42	DAP PANDO 2
C43	DAP BOXWOOD 1
C44	DAP WANCOOCHA 1
C45	DAP MOOMBA 8
C46	DAP MOOMBA 2
C47	DIO BIG LAKE 1
C48	DPP CORKWOOD 1
C49	DIO DELLA 3
C50	PON DELLA 1

Table 11–2, continued

Reference No	*Control Point Name*
C51	DIO BURKE 1
C52	DPP DILCHEE 1
C53	PON STRZELECKI 1
C54	DPP STRZELECKI 5
C55	DAP MUDLALEE 1
C56	DIO MURTEREE C-1
C57	PON MURTEREE 1
C58	DPP MCKINLAY 1
C59	DIO TOOLACHEE 5
C60	DIO TOOLACHEE EAST 1
C61	DIO TOOLACHEE 6
C62	DIO BRUMBY 1
C63	DAP TOOLACHEE 1
C64	DIO TILPAREE A-1
C65	DAP MULGA 1
C66	PEXA KUMBARIE 1
C67	DSL TINGA TINGANA 1
C68	PEXA WEENA 1
C69	PEXA CHERRI 1
C70	DSL ORIENTOS 1
C71	TEA TICKALARA 1
C72	DPP HUME 1
C73	DPP YANKO 1

Structure Contours

Top of Toolachee Formation (Plate 11)

The top of the Toolachee Formation reaches its deepest point, –3126 m, in the northern part of the Patchawarra Trough in DPP Wimma No. 1. The elevation of this datum is probably at about the same level in the northern part of the Nappamerri Trough, and was recorded at –2605 m in Burley 1 well in the southern part of the Nappamerri Trough. The shallowest recorded intersection of the top of the Toolachee Formation in the control points, and hence the shallowest coal measure sequence, is –1387 m in DPP Jackson 1 at the southeastern basin margin.

Base of Epsilon Formation (Plate 6)

The structure contours on the base of the Epsilon Formation are from the 'P' seismic structure contour map of Thornton & Youngs (1972) and also from the well intersection values at the selected control points. The seismic structure contour map compiled for the base of the Toolachee Formation, together with the known thicknesses of the Daralingie beds, Roseneath Shale and Epsilon Formation, were used as a control on the position of the base of the Epsilon Formation structure contours.

The structure contour map can only be regarded as approximate mainly as a result of the wide spacing of the control points and because there are disparities apparent between the 'P' and 'Z' structure contour maps, when compared with the thickness of the Gidgealpa Group in the Cooper Basin.

There are two major structural highs: the Gidgealpa–Merrimelia–Innamincka and the Nappacoongee–Murteree Anticlinal trends, with individual anticlinal culminations along these trends being associated with high-angle faults. Subsidiary northwesterly oriented anticlines at the northeastern end of both these major structural highs include the Karmona, Wolgolla and Tickalara Trends, which at the base of the Epsilon level are poorly defined. The major anticlinal trends subdivide the Cooper Basin into several broad negative structural entities, the two most prominent being the Patchawarra and Nappamerri Troughs. The Tennapera Trough is less pronounced and there is no data in the north to define the Arrabury Trough at this level.

The deepest level reached by the base of the Epsilon Formation is –3239 m in the Patchawarra Trough (Wimma 1 well), being slightly shallower at –3056 m in the Nappamerri Trough (Burley 1 well).

The major structures evident at this level are principally the northeasterly and northerly oriented structural axes, such as the Patchawarra Trough; the Gidgealpa–Merrimelia Trend and its northern continuation in the Innamincka Complex and Karmona Trend; the Nappacoongee–Murteree Trend; the Tennapera Trough; and in the northern part of the basin the Mount Howitt Trend, Windorah Trough, Little Hills Anticline, and Gilpeppee Trend; and other unnamed northerly oriented features. The northern and southern Cooper Basins are separated by a broadly defined, wide, hinge area, known as the Arrabury Hinge Line, and by the more prominent narrower Karmona Trend.

Base of Toolachee Formation (Plate 9)

The regional configuration of the structure contours at this level are essentially the same as Plate 11, i.e., the structure contours on top of the

Toolachee Formation. The shallowest elevation of the base of the Toolachee Formation is –1428 m adjacent to the eastern margin of the Canaway Ridge, but only 5 m of the formation is present here.

Top of Patchawarra Formation (Plate 5)

Structure contours on this datum are confined principally to the southern part of the Cooper Basin, as there are only two well intersections in the north in which the Patchawarra Formation has been identified.

The degree of structural complexity at this lithostratigraphic level, beneath the mid-Permian unconformity, is (as might be expected) greater than exhibited at the shallower Toolachee Formation level.

The major structures differentiated in the southern Cooper Basin (Plate 5) can be readily identified from the structure contour maps. The deepest parts of the Patchawarra Formation lie in the Patchawarra and Nappamerri Troughs. The majority of the Permian coal-bearing formations of the Gidgealpa Group have a similar distribution in the deeper troughs in the southern Cooper Basin.

The deepest well intersection of the top of the Patchawarra Formation is –3270 m in the Patchawarra Trough, but structure contours indicate that subsidence was greatest in the northern part of the Nappamerri Trough. Here, the contours suggest that the depth to the top of the Patchawarra Formation exceeds –3600 m.

Base of Patchawarra Formation (Plate 4)

Structure contours on the base Patchawarra Formation depict the net result of differential movements affecting the Cooper Basin, and thus it is the most intensely deformed part of the sequence. In addition to the major structural features illustrated by regional tectonic maps, there are several minor unnamed trends that are apparent from the structure contour maps.

The two major structural depressions, the Patchawarra and Nappamerri Troughs, have a maximum total thickness of about 3600 m and 4800 m of Permian and Mesozoic sediments, respectively. The estimates are based on the interpretation of seismic structure contours. Net subsidence in the Nappamerri Trough during the Permian and Triassic was greater than that experienced in the Patchawarra Trough. About 1200 m of Cooper Basin sediments are preserved in the Nappamerri Trough and about 720 m in the Patchawarra Trough.

The shallowest point of the base of the Patchawarra Formation interpreted from seismic structure contours lies at an elevation of about –500 m to the south of the Tennapera Trough in the extreme southern end of the Cooper Basin. In well intersections, the shallowest part of the formation occurs in the Cherri 1 well, just south of the Tennapera Trough at an elevation of –1274 m.

Net subsidence in the northern part of the Cooper Basin reached a maximum of about 3200 m in the Yamma Yamma Trough. The maximum thickness of sediments here is an estimated 360 m only, that is, about 1/3 of that recorded in the southern Cooper Basin.

The structural highs range in elevation from about –2000 m in the southern part of the Cooper Basin to about –2500 m farther north at their northern extremity, where they terminate against the mid-basin hinge line (Arrabury Hinge Line) and the Karmona Trend.

Conclusions on structural contours

A comparison of the four structure contour maps demonstrates a long history of subsidence and structural growth of the Cooper Basin during most of the Permian Period. Several structurally high areas are devoid of Permian sediments, including those at Packsaddle, Merrimelia, and Murteree. In addition, on the Daralingie, Murteree and Tickalara Structural Highs, and possibly on the Innamincka High, the Patchawarra Formation is absent, although it has been identified in the Arrabury area in the northern Cooper Basin. The remainder of the northern Cooper Basin contains undivided Gidgealpa Group. The absence of the Patchawarra Formation over several high crests along the Gidgealpa–Merrimelia/Nappacoongie–Murteree and Tickalara Trends (Merrimelia, Packsaddle, Innamincka/Daralingie/Murteree/Tickalara) is indicative of uplift during the Early Permian and of erosional removal from the crests during mid-Permian.

Similar tectonic growth took place during the Late Permian, and most of the bald-headed structural highs were maintained into the Late Permian. Differential movements are indicated by comparing the relative distributions of the Toolachee and Patchawarra Formations over the culminations of the mid-basin highs.

Isopachs

In the southern Cooper Basin, the greatest thickness of the two principal Permian coal-bearing formations, the Toolachee and Patchawarra Formations of the Gidgealpa Group, generally occurs in the Patchawarra and Nappamerri Troughs, with a few exceptions. On the other hand, in the northern Cooper Basin, the distribution and thickness of the Toolachee and Patchawarra Formations

is largely unknown, and the thickness of the Gidgealpa Group is generally only a fraction of the sections present south of the Arrabury Hinge Line and Karmona Trend (Fig. 11–4). Except in the Yamma Yamma Trough, the subsidence in the northern Cooper Basin in the Permian was negligible compared to that in the southern part of the basin.

Gidgealpa Group (Fig. 11–4)

The Gidgealpa Group reaches a maximum thickness probably in excess of 1200 m in the northern part of the Nappamerri Trough, and slightly less in the southern part. About half that thickness is present in the Patchawarra Trough. The thickest sequence of Gidgealpa Group penetrated is an

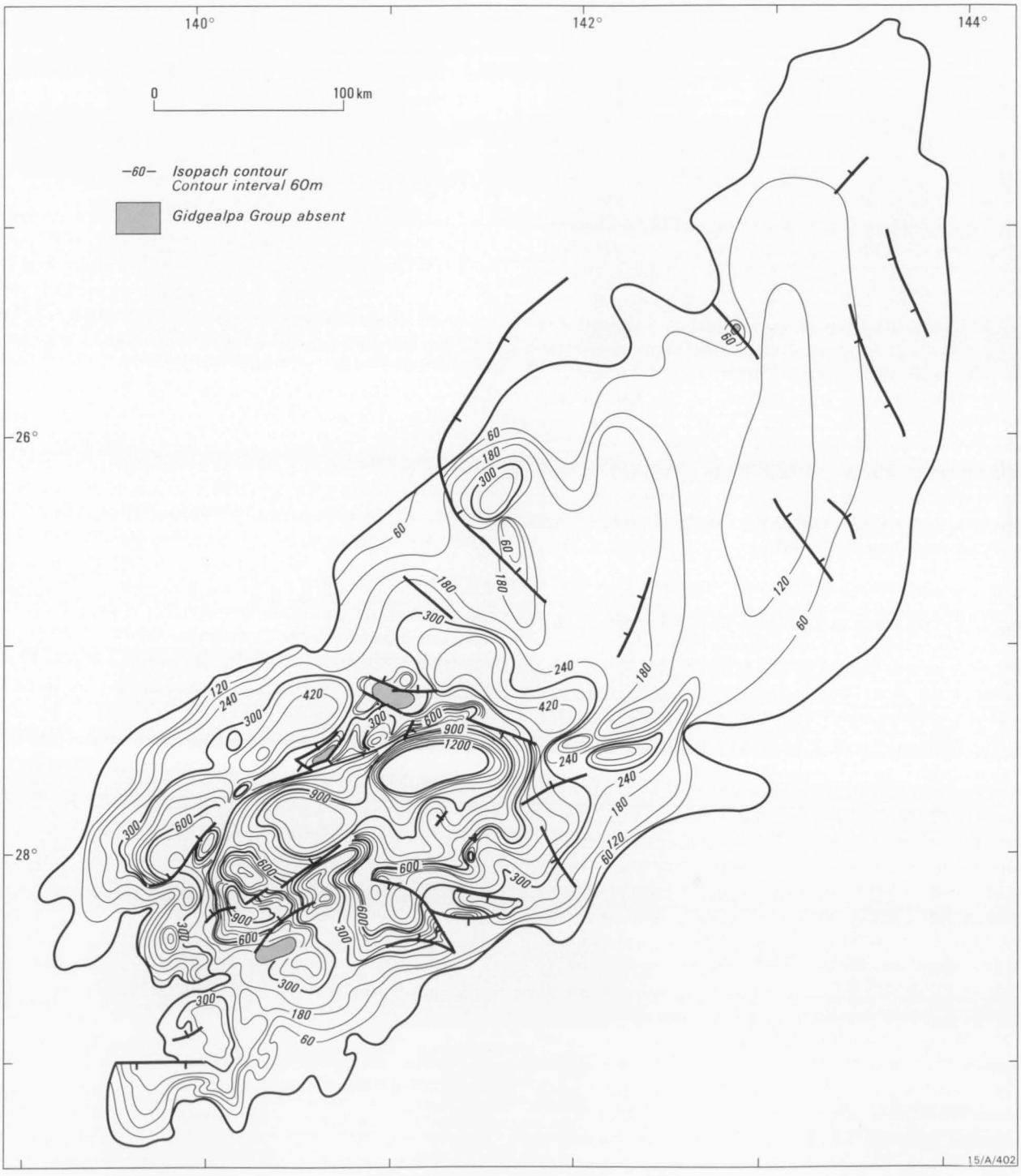

Fig. 11–4. Gidgealpa Group isopach map.

incomplete intersection of 992 m in Burley 1 in the southern part of the Nappamerri Trough. The Group reaches over 600 m thick at five other control points: Dilchee 1 (623 m), Toolachee East 1 (631 m), Jack Lake 1 (663 m), Big Lake 1 (660 m), and Tallalia 1 (665 m).

In the southern part of the Cooper Basin, the Gidgealpa Group thins gradually towards the basin margins, but the closely spaced isopachs around the faulted mid-basin structural highs indicate a more rapid thinning. The combined effects of erosion, compaction and truncation over and near each of the major mid-basin features have been discussed by Battersby (1976).

The thickness variation of the Gidgealpa Group in the north is only slight with the exception of the small Yamma Yamma Trough, which probably contains over 360 m of Late Permian sediments. Elsewhere, the Group thins gradually towards the margin of the basin.

Toolachee Formation (Plate 12)

The maximum thickness of the Toolachee Formation in the northern Cooper Basin is 329 m in the Yamma Yamma Trough. This is recorded in DPP Gilpeppee 1 well and is anomalously thick, especially as the thickness is only 55 m in the Gilpeppee 2 well, about 5 km to the southeast. Most of the subsidence in the Yamma Yamma Trough apparently took place in the Late Permian; no Patchawarra Formation is known in either of the Gilpeppee wells. Data on the Toolachee Formation elsewhere in the northern Cooper Basin are insufficient to draw any conclusions on its regional thickness variations.

The largest areas of thick Toolachee Formation in the southern Cooper Basin occur in the Nappamerri and Patchawarra Troughs, with 157 m recorded in Burley 1 (Nappamerri Trough) and 107 m in Wimma 1 (Patchawarra Trough). However, the thickest sequences in the selected control points occur to the south of the Nappamerri Trough in Orientos 1 (186 m) and Brumby 1 (165 m). Both these well sequences lie on structural highs, and greater thicknesses may be present in structurally lower areas.

The Toolachee Formation thins gradually away from the two major basin troughs towards the basin margins except where mid-basin ridges and culminations, including the Gidgealpa–Merrimelia and Nappacoongie Trends, interfere with the generally symmetrical pattern of isopachs and, in places, protrude through the Permian sedimentary cover. The gradual change in thickness of the formation across the southeastern margin is interrupted on the Brumby and Orientos structural highs.

Daralingie beds, Roseneath Shale, and Epsilon Formation (Plate 8)

The isopach map (Plate 8) of the Daralingie beds, Roseneath Shale, and Epsilon Formation was compiled by combining the isopach maps of the individual units as given by Thornton (1978) with the thickness of formations intersected at control points. The thickest known sequence of the lower Stage 5 interval occurs in the Nappamerri Trough where an excess of 270 m is interpreted over a wide area. The maximum thickness is 294 m intersected in Burley 1 well.

Thicknesses over 150 m are present in the Tennapera Trough, with a maximum thickness of almost 190 m (Toolachee East 1 well–includes all three formations). The formations are absent over large parts of the Gidgealpa–Merrimelia Trend, the Nappacoongie–Murteree Trend, and in an area towards the Kooperamanna–Naryilco High.

Only a thin sequence occurs in the Patchawarra Trough, where it averages about 30 m thick. Maximum thickness known in the Trough is about 60 m (Kanowana 1, and Jack Lake 1 wells). Only the Epsilon Formation is present in Kanowana 1 well, and the Daralingie beds are absent in Jack Lake 1 well.

Patchawarra Formation (Fig. 11–5)

The thickest-known sequence of the Patchawarra Formation is in Burley 1, where an incomplete unit of 459 m was recorded in the Nappamerri Trough. A thickness of 600 m in the northern part of the Nappamerri Trough is inferred from seismic structure contour intersections. The thickest sequence in the Patchawarra Trough is 399 m (Jack Lake 1) in the south. The thinning is gradual towards the margins of the Cooper Basin. The steep isopach gradients against the mid-basin highs is due to a relatively rapid decrease in thickness, compared to the basin margins, and indicates supratenuous folding.

Coal

Coal is widespread in the Permian Cooper Basin (Figs 11–6 and 11–7) and there are both Lower and Upper Permian coal measures, as in most eastern Australian marginal and intracratonic basins of that age.

In addition to being the reservoir for the major accumulations of hydrocarbons, the Early Permian Patchawarra and Late Permian Toolachee Formations of the Gidgealpa Group also contain major coal deposits.

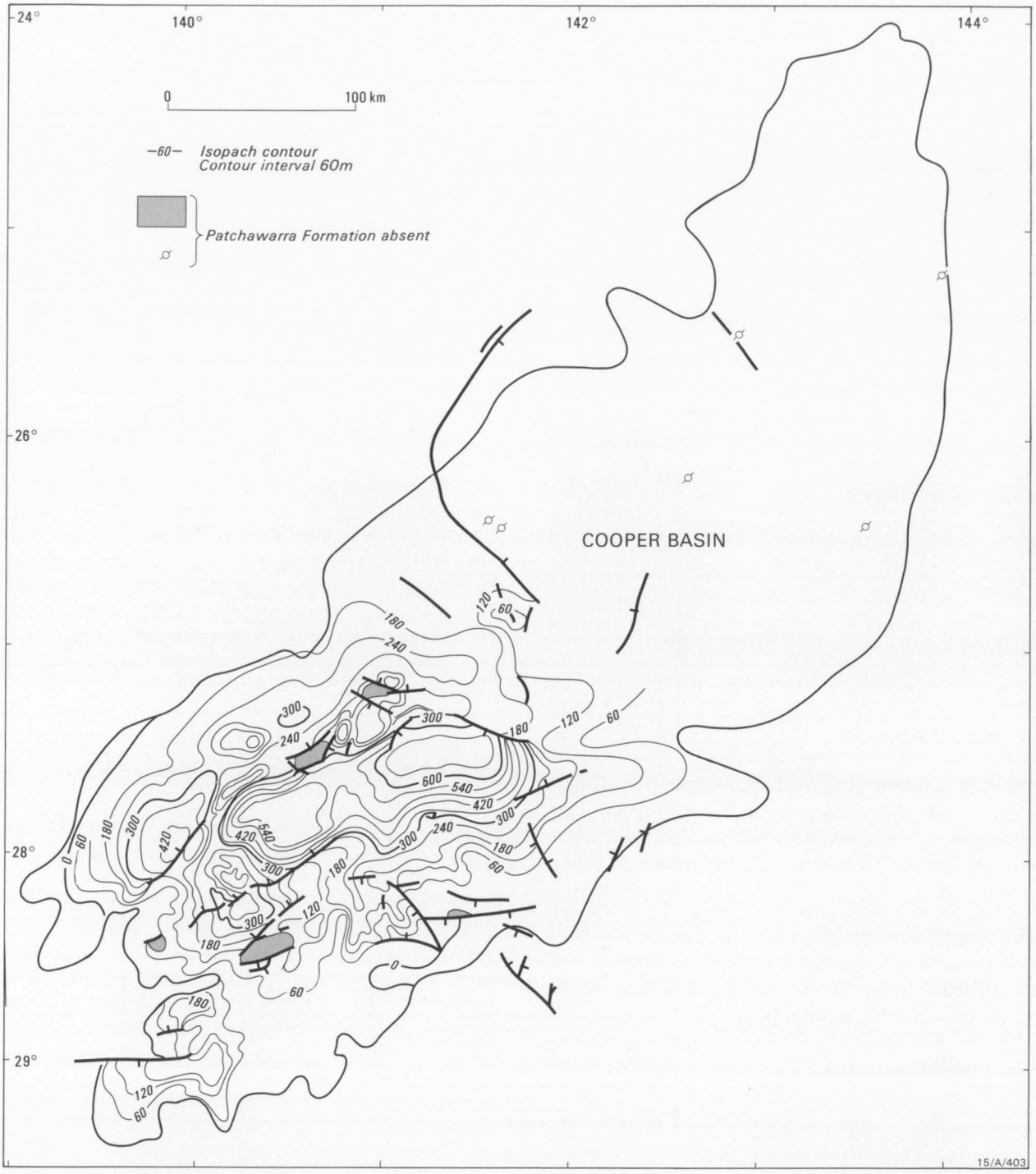

Fig. 11–5. Patchawarra Formation isopach map.

The Patchawarra Formation generally occurs at depths between 2000 and 3000 m, and associated coal has its greatest development in the northwestern sector of the southern Cooper Basin where the formation is 250 to 500 m thick. The aggregate thickness of the coal seams is generally about 50 m. One coal seam, up to 25 m thick, extends over at least 1500 km², but most seams are less than 3 m thick (Johns, 1975). Gradational contacts with shale occur above and below the coal interval.

The Toolachee Formation is generally 2000–2500 m below the surface, and in the Moomba Gas field is 117 m thick. Black bituminous coal occurs in ten seams which have an aggregate thickness of 13 m, with the thickest seam being 5 m. Coal in the Toolachee Formation is black, bituminous, varies from dull to shiny, and normally has a blocky fracture. Lenses and bands of hard, smooth, brown siderite are common in the coals and in some shales. The early Permian Daralingie beds and Epsilon Formation also have minor coal and are minor reservoirs of gas.

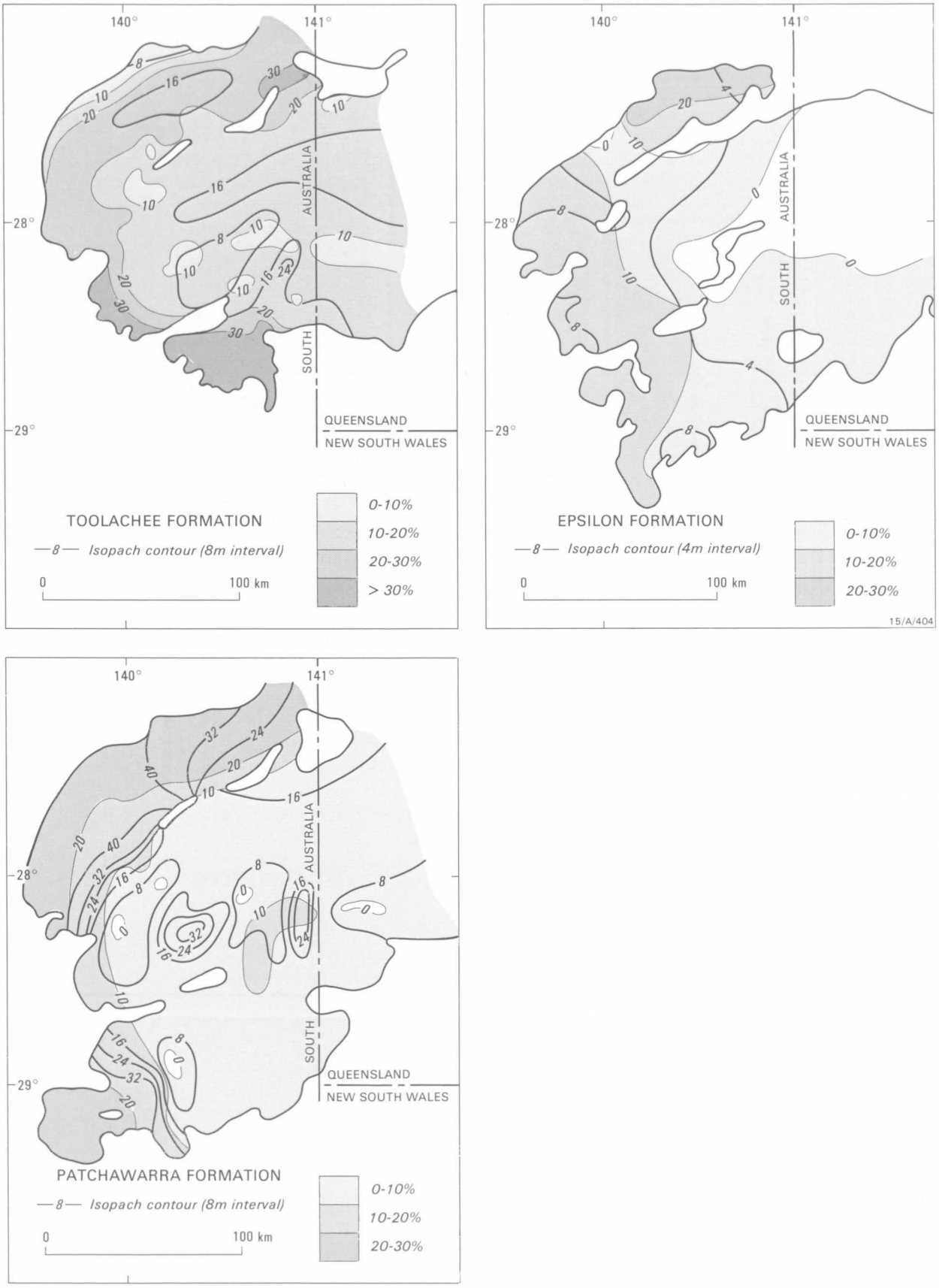

Fig. 11–6. Coal thickness and percentage in the Patchawarra, Epsilon and Toolachee Formations, southern Cooper Basin.

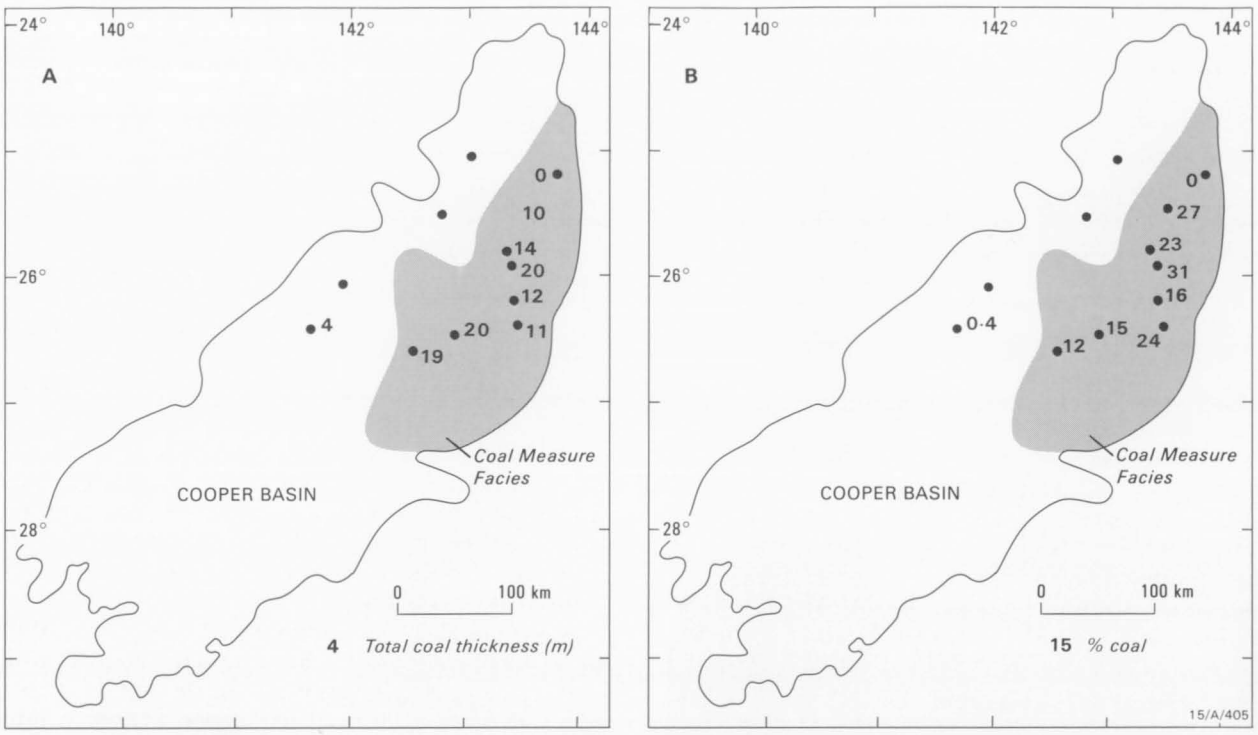

Fig. 11–7. Coal thickness (in m)(A) and coal percentage (B) in the Gidgealpa Group, northern Cooper Basin.

Depositional Environments

The southern Cooper Basin contains up to 1600 m of Gidgealpa Group sediments which cover 60 000 km². The equivalent sequence in the northern part of the Cooper Basin is much thinner, and has been intersected by fewer drillholes with a smaller aggregate coal thickness.

In a regional stratigraphic study of the southern Cooper Basin, Thornton (1979) interpreted the sedimentary setting and palaeogeography of several chronostratigraphic units. The environmental analyses are based on core studies of the cyclicity of sedimentation, using linear regression techniques. The palaeogeographic maps were compiled from a lithofacies analysis, broadly outlining areas of optimum coal formation and preservation, useful in predicting coal type and rank.

The postulated depositional setting of the Gidgealpa Group include rivers, lakes, coal swamps and large inland 'seas' during a period when the topographic relief diminished with time. Initially, the environment was mainly braided fluvial, gradually transforming to a meandering stream system on a floodplain. Coal measures formed swamps marginal to fluvial milieus. Palaeogeographic maps by Thornton were semi-diagrammatic, but clearly delineate channel, restricted sea or lake, overbank, lake and swamp, interdistributary bay, lower coastal plain (coal-poor), upper coastal plain (coal-rich), delta plain, and delta front accumulations. Various combinations of these palaeogeographic divisions are indicated for each chronostratigraphic unit, and suggest areas of optimum coal formation and preservation.

The principal stages of coal genesis were during deposition of the Patchawarra Formation (Stage 3, Lower Stage 4 and early Upper Stage 4) and the Toolachee Formation (Upper Stage 5) (Fig. 11–6).

Coal Deposition

Facies studies of the Cooper Basin by Thornton (1979) and Stuart (1976) showed that the coal-bearing units in the Gidgealpa Group are fluvial and deltaic in origin. It was concluded that the Cooper basin coals were deposited in backswamps on alluvial plains and upper delta floodplains, along with mudstone and siltstone. The facies maps of Thornton (1979) and the coal percentage maps of Schwebel & others (1980) (Fig. 11–6) suggest that differences in subsidence rates in various areas controlled coal deposition within the sedimentary systems of the southern Cooper Basin.

On the coal percentage maps of Schwebel & others (1980) (Fig. 11–6), the higher values are present around the margins of the Nappamerri and Tennapera Troughs, and fairly evenly distributed throughout the Patchawarra Trough; whereas low coal percentages and high proportions of sandstone occur along the axis of the Nappamerri Trough (Thornton, 1979). This suggests that coal swamps developed away from more rapidly subsiding trough axes, which attracted the main stream channels. On the trough flanks, the

amount of stream-transported terrigenous detritus was small in contrast to the coal sedimentation rate, allowing thick seam development, whereas along the trough axes, clastic material continually diluted the original peats. This suggests that Patchawarra Trough subsidence just kept pace with both the rates of overbank sedimentation and peat accumulation, so that it did not attract channel belts. This control of coal and sandstone distribution by tectonic subsidence was demonstrated in a basin, much smaller than the southern Cooper Basin, by Read & Dean (1982).

The setting in the northern Cooper Basin is uncertain because control points are scarce, but if coal-bearing facies are confined to the eastern half of the basin, as suggested by Senior (1975) (Fig. 11–7), the western part of the northern Cooper Basin probably subsided faster than the eastern part, though this subsidence was generally slower than in the southern Cooper Basin. An exception to this pattern is the Yamma Yamma Trough, which contains the very thick Toolachee Formation, indicating more rapid subsidence late in the Permian.

Land plants contributed the bulk of the organic matter to the sediments of the Cooper Basin, and inertinite, vitrinite and exinite are common kerogen types present in both the organic-rich shales and generally throughout the Permian coal measures (Schwebel & others, 1980; Smyth, 1979). The coal content and thickness of the Permian formations vary areally, and Schwebel & others (1980) consider that the coal content of the hydrocarbon-bearing formations may provide an index of source potential. They have assumed that the hydrocarbons in the Permian sediments have come from a reasonably uniform non-marine source, as no marine sediments have been recognised in the Cooper Basin. However, the depositional environments of the shale sequences in the Gidgealpa Group (Murteree and Roseneath Shales) have not been clearly defined. Thornton (1979) suggests that both of these formations accumulated in a large (250 km x 150 km) lake that transgressed from the east and submerged the whole of the Cooper Basin. Thornton (1979) also suggested, however, that trace fossils in the shales indicate biogenic activity in the lakes and that a restricted marine environment might have existed. He believed that this is consistent with the wider regional relationships between the Cooper Basin facies and those in other eastern Australian Permian basins, thus suggesting marine influence extending as far west as the Cooper Basin. It is, however, unnecessary to invoke widespread marine transgressions during Stage 4 time. Our view is that the shale units formed in lakes restricted mainly to the southern Cooper Basin by movements on the Karmona Trend (see discussion under Roseneath and Murteree Shales).

The presence of all three microlithotypes (inertinite, vitrinite and exinite), in the coal, indicate the interaction of several different environments on the peat, which would appear at first sight to be at variance with the postulated widespread uniform conditions existing during the history of the Cooper Basin in a lake or shallow sea. Microlithotypes rich in vitrinite are all formed from forest swamp vegetation. A high groundwater level is necessary for protection from the atmosphere to guarantee the preservation of the woody tissues as vitrinite. Although both vitrinite and inertinite are both thought to be derived from woody plant tissue, inertinite is always preserved in an oxidising environment — and thus is an indicator thereof. Hence, inertinite is interpreted as representing an oxidised peat surface, which at intervals lay above the groundwater table. Exinite is thought to have accumulated in herbaceous swamps and was the product of the accumulation and degradation of spores, leaf and herbaceous tissues. Consequently, the varied composition of the coaly material suggests that they have been formed in several types of coal-creating milieus.

Assuming that the ultimate coal type is related to water-table effects in the original peat-forming environment, tectonism is one of the major factors controlling the principal coal types. Hence, bright vitrinite-rich coals with many intervening dirt bands are probably formed under relatively unstable, rapid-burial and reducing conditions. Dull coal may be deposited in a relatively more stable environment. Further details on coal microlithotypes and their significance are given by Hunt (Chapter 19).

Future Potential

The in situ quantity of coal in the South Australian portion of the Cooper Basin was estimated by Schwebel & others (1980) as 1.1 x 10^{12} tonnes. They made this estimate in assessing the in situ coal gasification potential of the Cooper Basin. The estimate of 1000 billion tonnes is enormous by any world standard, and the Cooper Basin deposits are certainly one of the world's major reserves of fossil fuels. For non-specialist readers it is emphasised, therefore, that the coal is too deeply buried to be worked by any existing technology; the great depth is well illustrated by the cross-sections on Plate 22. In informal discussions, it is common to talk about future underground gasification and robot-mining, but at present, and for the forseeable future, all the coal that can be utilized in Australia can be dug from open-pit mines, and from shallow underground mines in other basins.

Acknowledgements

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CHAPTER 12

Late Permian Coal Measures Beneath the Olive River Basin, Queensland

by
A.T. Wells

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Introduction

The Olive River Basin (Plates 1 and 2) has no surface expression, but the sedimentary sequence overlying metamorphosed basement rocks is indicated by seismic and magnetic data to be 900 m thick. The stratigraphy was largely unknown until recent drilling by Utah Development Company (Murphy, 1979), although until then it was considered that the sediments are probably similar to those of the Carpentaria Basin.

Geological Setting

The Olive River Basin (Fig. 12–1) is roughly circular in outline, about 45 km in diameter and 900 m deep, and prior to recent exploratory drilling had been mapped only by seismic and aeromagnetic methods. The generalized stratigraphy of the basin is given in Table 12–1. Triassic sediments may be present in the central part of the basin.

The geophysical data delineate a depression, circular in horizontal section, in the crystalline basement in the western part of the Cape Weymouth Sheet area, which was named the Olive River Basin. This basin occurs within the Weipa Depression on the eastern margin of the Carpentaria Basin. It is bounded on the east by the Peninsula Ridge, and on the north, south and west by subsurface basement rocks which rise to about 450 m below sea level around the basin. The Olive River, Carpentaria, Laura and Eromanga Basins are penecontemporaneous: Mesozoic rocks are continuous from the Carpentaria Basin into and across the Olive River Basin.

In the Olive River Basin, the depth to magnetic basement of 1200 m, and the maximum depth to seismic basement of 1000 m, are in fair agreement.

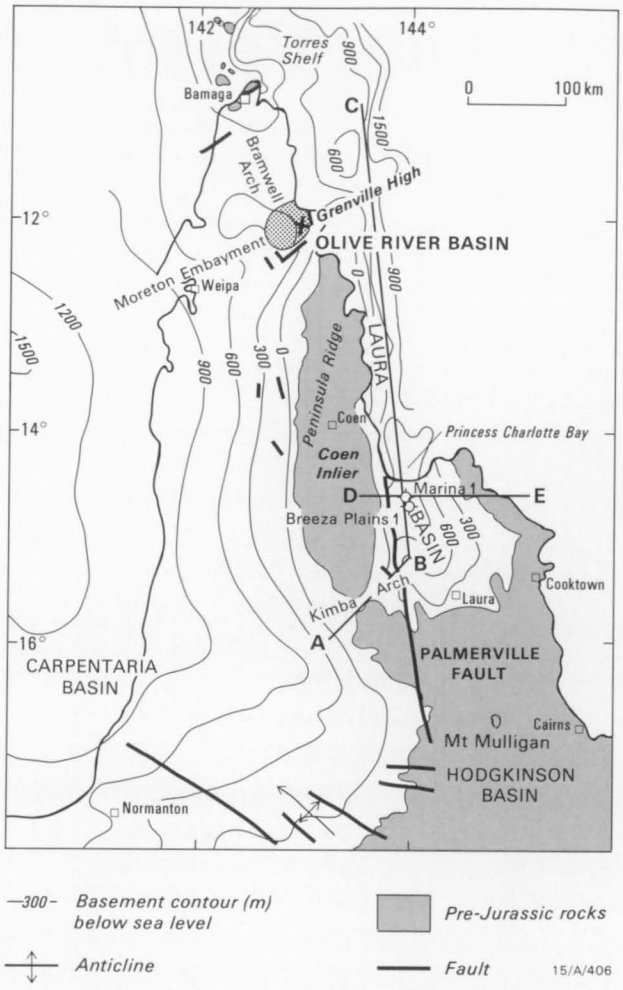

Fig. 12–1. Locality map of the Olive River Basin.

TABLE 12–1. GENERALIZED STRATIGRAPHY OF THE OLIVE RIVER BASIN REGION

Age	*Formation*	*Lithology/Remarks*
Late Jurassic to Early Cretaceous	Gilbert River Formation	Sandstone, quartzose, clayey, glauconitic in upper part, very minor coal. Fluviatile lower part, marine upper part.
Middle Jurassic	Helby Beds	Sandstone, quartzose, clayey, paralic and marine. Boundary with the underlying Garraway Beds is a marker bed of fine to coarse-grained quartz sandstone with a matrix of iron-rich chlorite of chamosite type with siderite–ankerite of marine origin.
Early to Middle Jurassic	Garraway Beds	Sandstone, quartzose, clayey; coal seams in upper part; fluviatile.
Late Permian	–	Carbonaceous siltstone and shale, quartzose sandstone and minor coal. Lacustrine.
Early Permian	Weymouth Granite	
Carboniferous to Early Permian	Kangaroo River Volcanics Janet Range Volcanics	
Early Carboniferous (Visean)	–	Similar to Pascoe River Beds. Intersected in one drill hole. Coarse to very coarse-grained quartzose sandstone and minor siltstone interbeds. Contains palynomorphs.
Proterozoic	Sefton Metamorphics	

Structure

The sedimentary units have a shallow westerly dip. A major fault on the eastern side of the basin seems to have controlled deposition in the Permian, but there are apparently no faults in the Jurassic sequence.

The Olive River Basin is intracratonic and, consequently, has not been subjected to compressive folding (Smart & Senior, 1980). The shallow dips in the sediments have been attributed to original deposition, modified by the effects of drape over basement highs and differential compaction. Post-early Cretaceous movements reactivated several major basement structures and are expressed in the older Mesozoic rocks by faults, anticlines and monoclines. There are few structures visible at the surface and most have been interpreted from geophysical and bore-hole data.

Biostratigraphy

Permian palynomorphs from several exploratory drill holes have been dated by Price (Appendix II–in Murphy, ?1979), and assigned to Upper Stage 5, upper part of Upper Stage 5, the *P. reticulatus* Assemblange, and TR1a biostratigraphic units.

Plant macrofossils were identified by Rigby (Appendix III–in Murphy, ?1979) as Permian in age and included: *Sphenopteris lobifolia*, Morris; *Glossopteris communis*, Feistmantel; and *Glossopteris elongata*, Dana.

The associated microflora suggest a palynological Stage 3 or Stage 4 assemblage, but most of the species are long-ranging. Rigby considered that they were unlikely to be as young as those of the Late Permian coal measures and other coal formations of similar stratigraphic position in the Bowen Basin.

Coal Geology

Permian coal seams occur over a restricted area in the Olive River Basin. Exploratory drilling (Murphy, ?1979) has intersected 2.35 m of coal in two plies 0.9 and 1.44 m thick, separated by 0.29 m of mudstone, but coal was not intersected in nearby holes. The Permian coals range in depth from 98 m to 364 m and are of coking quality. The known aerial extent of Permian coal is small and the sequence is probably affected by faults.

The exploratory drilling has yielded poor results and further work is considered to be uneconomic (Murphy, ?1979). Geophysical investigations are recommended where seam thickening to the west is indicated and may prove areas for further drilling providing that the overburden is relatively thin.

Acknowledgements

The chief sources of information used to compile this chapter are Murphy (?1979), Pinchin (1973), Smart & Rasidi (1979), Smart & Senior (1980), and Willmott & Powell (1977).

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CHAPTER 13

The Late Permian Mount Mulligan Coal Measures, Queensland

by
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Introduction

The late Permian Mount Mulligan Coal Measures at Mount Mulligan, about 40 km northwest of Dimbulah, consist of up to four composite coal seams. The maximum thickness of these measures is probably over 245 m, with the coal seams ranging from about 8 cm up to a worked thickness of 1.7 m, and a maximum of 2.1 m. It is unlikely that significant mineable reserves remain at Mount Mulligan. The postulated source of sediments in the Mount Mulligan Coal Measures is from the west and southwest.

The publications used to compile the data on the Mount Mulligan Coal Measures include those by Amos & de Keyser (1964), de Keyser & Lucas (1968), and Hawthorne (1975).

Stratigraphy

Mount Mulligan in northern Queensland (Plates 1 and 2) is a rift block largely of sandstone and conglomerate of the Mesozoic Pepper Pot Sandstone, with the Late Permian Mount Mulligan Coal Measures at the base (Fig. 13–1). The coal measures include conglomerate, arkose and other sandstone types, pebbly sandstones, siltstone, shale, fireclay, and coal.

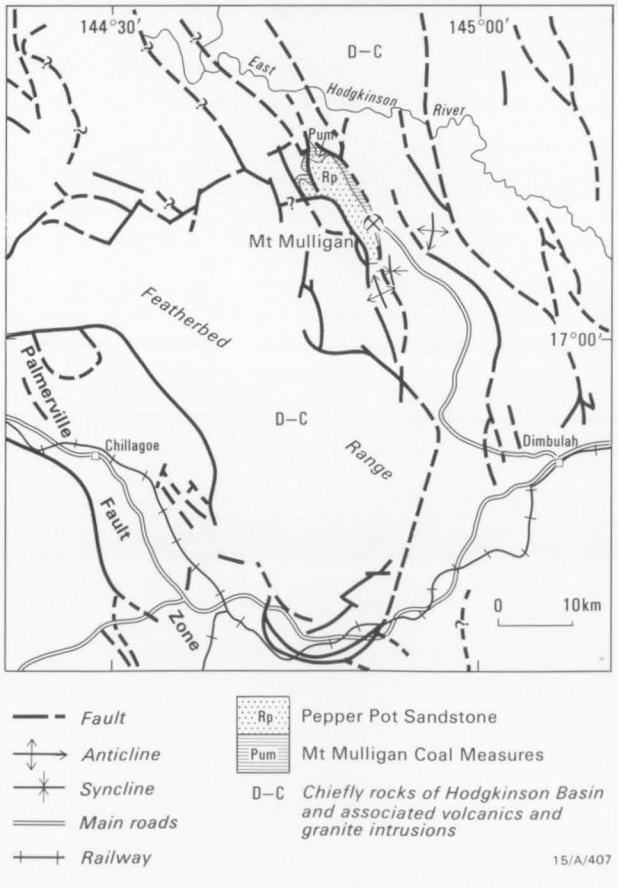

Fig. 13–1. Structural setting and location of the Mount Mulligan Coal Measures.

In the type area around the State Mine, the base of the coal measures consists of only about 5 m of blue-grey conglomerate, with phenoclasts from the underlying Devono-Carboniferous Hodgkinson Formation, and some of rhyolite. By contrast, the basal conglomerate and arkose on the north flank of Mount Mulligan are several hundred metres thick. The conglomerate is either massive or thickly bedded with well-rounded phenoclasts 2–8 cm across of rhyolite and subordinate vein quartz and chert, but clasts from the Hodgkinson Formation are rare.

The basal beds are overlain by the productive coal measures of thinly bedded and laminated coal, clay and fine sandstone, with considerable lateral changes in lithofacies. There are up to four composite coal seams, normally from about 0.4 m to about 1.7 m thick, although at the King Cole Mine the seam locally measures 2.1 m. The seams are interbedded in alternating shale and clay with minor sandstone and siltstone.

The coal measures change in thickness from possibly over 245 m at the northern end of the outcrop, to more than 90 m a few kilometres to the south, wedging out about 0.7 km south of the King Cole Colliery. The productive measures are about 6 m thick at the King Cole Colliery, and about 35 m at the State Colliery. Although the coal seams at the State Mine maintain a uniform thickness, the interlaminated shale bands thin out uniformly from east to west. The seams are discontinuous to the south and only one seam occurs at the King Cole Colliery, wedging out rapidly to the west and southwest.

A coal measure succession, different from the type section, is present in drillholes northwest of the State Colliery, where it is 60 m thick, with only one band of poor quality coal near the base.

At the northernmost locality of Mount Mulligan, thin layers of impure coal are present in thinly bedded and laminated grey shale, siltstone and fine-grained sandstone. Bedding is irregular and shows fine cross-lamination.

The Mount Mulligan Coal Measures are overlain by about 300 m of conglomerate and sandstone, known as the Pepper Pot Sandstone, which is probably mainly of Mesozoic (?Triassic) age, although de Keyser & Lucas (1968) suggested that the lowermost conglomerate is probably Permian in age, on the evidence of its lithological similarity to the basal Permian conglomerate. It was postulated by de Keyser & Lucas, on the evidence from lithology, cross-bedding and coal seam distribution, that the clastic material of the Mount Mulligan Coal Measures was derived from the west and southwest, whereas that of the overlying Mesozoic sequence probably from the east and southeast.

A red tuff band about 30 cm thick forms the base of the Mesozoic Pepper Pot Sandstone at a slight angular unconformity with the Mount Mulligan Coal Measures.

Structure

The Permian coal measures dip mostly at less than 20°, except along the faulted edges of Mount Mulligan where the beds are locally overturned. The structure is a broad flat-bottomed asymmetrical syncline formed by drag during downfaulting of the Mount Mulligan fault block.

Correlation and Age

David (1932) correlated the Mount Mulligan Coal Measures with the Collinsville Coal Measures and considered them to be Lower Permian, but later (David, 1950) revised it to Late Permian. The Mount Mulligan Coal Measures are now assigned to the Late Permian (de Jersey, 1947, 1949; and P.R. Evans, pers. comm., in de Keyser & Lucas, 1968). They are approximately equivalent to the Baralba Coal Measures of the southeastern Bowen Basin and to the Wollombi and Newcastle Coal Measures of the Hunter Valley. Other coal measures of approximately the same age include the Rangal Coal Measures of the Blackwater area, the Illawarra Coal Measures of the western Sydney Basin, Coorabin Coal Measures, and Cygnet Coal Measures in Tasmania (Branagan, 1975).

Quality and Reserves

The coals are classed as subhydrous, high-volatile bituminous, with a calorific value of between 15×10^6J and 23×10^6J (14 000 and 14 600 BTU) (de Jersey, 1949). The dominant coal type consists of subhydrous durain with some clarain bands. The coal has an ash yield of 15–18% and is unsuitable for coking.

The last figure available for coal reserves is 1 144 000 tonnes (1 175 000 Imperial tons) for the two main seams of the three seams mined (Powell Duffryn, 1949).

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CHAPTER 14

Permian Coal Measures in the Sub-Laura Basin Sequence, Little River – Oakey Creek District, Queensland

by
A.T. Wells

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Introduction

Coal was discovered in both the Little River and Normanby River areas in the late 19th century in sections that are now known as the Little River Coal Measures and the Normanby Formation. The former were named by Bryan (1928) and the latter, earlier known as the Oakey Creek Coal Measures, by Lucas & de Keyser (1965).

Outcrops of the coal-bearing formations occur in two small fault blocks, which have been intersected in two petroleum exploration wells. Exploratory drilling for coal in recent years has had discouraging results.

Geological Setting

The Laura Basin occupies 18 000 km² onshore and 16 000 km² offshore (Fig. 14–1), with the graben-like depression beneath Princess Charlotte Bay being a northward extension of this basin (Plates 1 and 2).

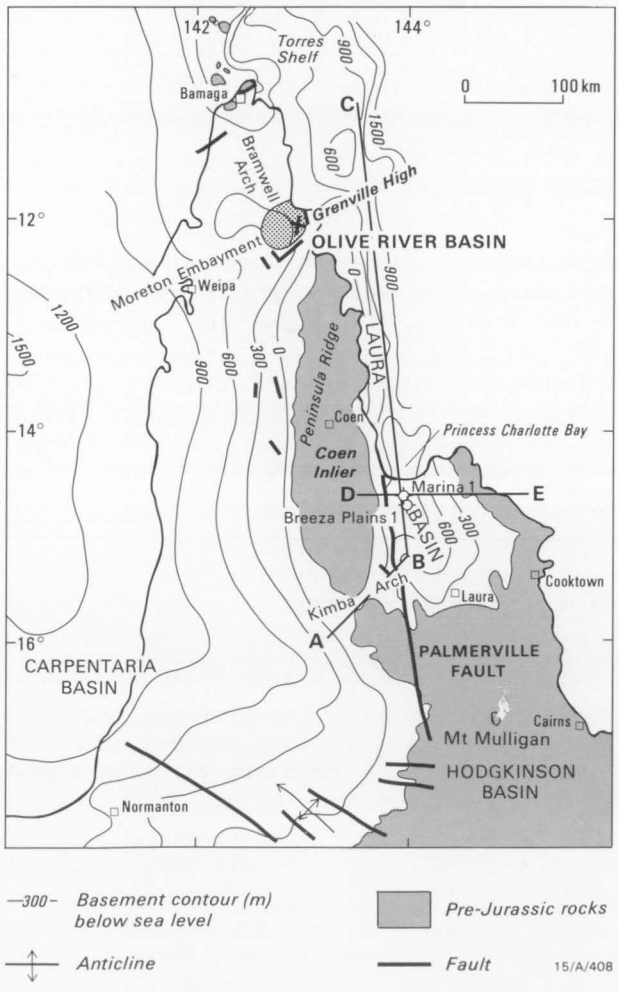

Fig. 14–1. Location and structural framework of the Laura and Olive River Basins.

The Jurassic and Cretaceous sediments of the Laura Basin, and possibly the sub-Laura Permian sequence also, probably extend to the edge of the continental shelf. The basin is bounded to the south, west and east by unconformable contacts with the underlying Precambrian Dargalong Metamorphics, the Siluro-Devonian Chillagoe Formation, the Devono-Carboniferous Hodgkinson Formation, and late Palaeozoic granite.

The Laura Basin is separated from the Carpentaria Basin by the Peninsula Ridge, and in the subsurface to the southwest by the Kimba Arch. It is separated from the Torres Shelf to the north by the Grenville High (Fig. 14–2).

The late Permian lacustrine and paralic sediments and intercalated volcanics were deposited in isolated, shallow basins on a denuded, low surface. These basins were subsequently broken up into narrow segments by rifting and block faulting and are now preserved in grabens and half-grabens beneath the Laura Basin. This basin was initiated in the Jurassic by renewed displacement on the Palmerville Fault, along which movements continued for some time. The direction of fault movements in the Cainozoic were reversed, with the eastern side being upthrown.

The thickness of Laura Basin offshore sediments is 2100 m, estimated from seismic data, and the maximum drilled thickness is 115 m (Day, 1976).

The Permian and ?Triassic sequence in the sub-Laura Basin is less than 100 m thick (Smart & Rasidi, 1979). However, a reinterpretation of seismic reflection events (Pinchin, 1974) suggest that a thick unit beneath the Laura Basin is Permo-Carboniferous in age. The reflections, which dip almost continuously between 0.6–4.0 seconds of time, may originate from the base of, and within, an 8 km-thick sequence of Permo-Carboniferous sediments beneath the flat-lying Mesozoic Laura Basin, and overlie tightly folded Carboniferous to Devonian rocks of the Hodgkinson Basin.

Subsurface intersections of Permian indurated sediments are steeply dipping. The Hodgkinson and Chillogoe Formations are tightly folded, faulted and intruded by late Palaeozoic granites. The Dargalong Metamorphics occur only west of the Palmerville Fault.

Permian and Triassic rocks also occur in the Cape Grenville area of the Torres Shelf.

Permian Stratigraphy

The Permian coal-bearing formations are known in restricted outcrops and subsurface in the Laura Basin. The Permian sediments are part of the uneven basement consisting of folded Palaeozoic sediments and granite unconformably beneath the

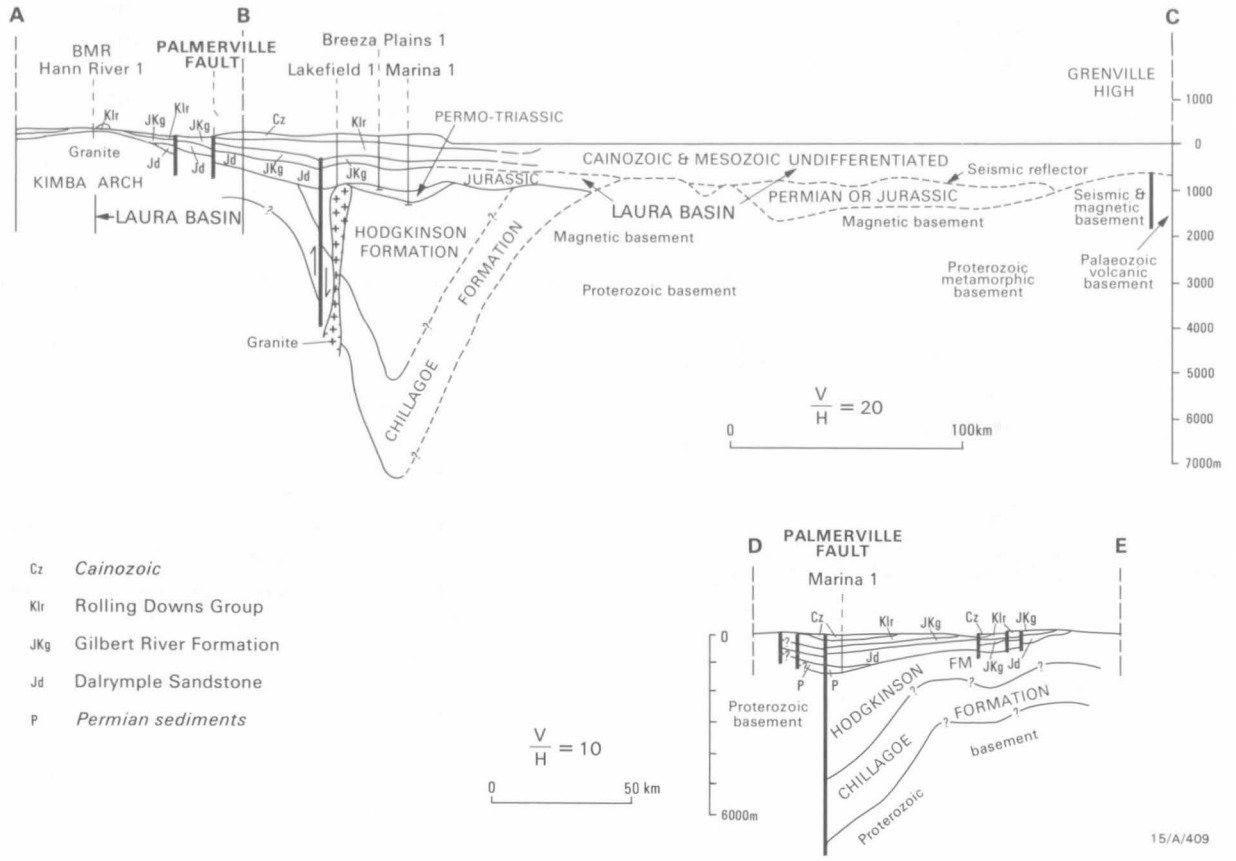

Fig. 14–2. Cross-sections of the Laura and Olive River Basins.

Mesozoic sediments of the Laura Basin. The generalised stratigraphy of the Laura Basin and sub-Laura Basin sequence is described below (after Day, 1976), and summarised in Table 14–1.

Permian Coal Measures In Outcrop

Little River Coal Measures

The type area of the Little River Coal Measures is a narrow 20 km long fault block along the Palmerville Fault. The Little River Coal Measures are strongly folded and faulted as a result of rifting and are poorly exposed; the thickness is unknown. The coal measures are poorly exposed in a meridional depression flanked by the Chillagoe Formation on the east and cliffs of Mesozoic sandstone on the west. The outcrop occurs in a down-faulted block along the Palmerville Fault and is flanked by Precambrian rocks with a cover of Mesozoic strata in the west, and by Silurian–Devonian strata in the east.

The outcrops comprise pale grey, thickly bedded, medium to coarse-grained feldspathic and lithic sandstone; grey, silty shale with plant fossils; and interbeds of medium-bedded lenticular dark impure limestone; thin bedded fine-grained sandstone, and impure coal. Calcareous veinlets and limonite are common in the fault zones. The coal seams are up to 7 m thick, but their steeply dipping and faulted nature would make extraction difficult.

Plant macrofossils are probably Upper Permian in age (White, 1961).

Normanby Formation

The type area of the Normanby Formation is in three, small elongated faulted outliers along a meridional line 28 km west of Cooktown. The formation comprises probably several thousand metres of thin-bedded micaceous sandstone, thick-bedded coarse to fine-grained feldspathic sandstone, dark silty calcareous shale, thick beds of pebble conglomerate, and thin impure limestone beds. At least 30 m of massive laminated impure coal occurs in the western (upper?) part of the formation. In the central or eastern (lower?) part of the northern and southern outliers, thick flows of fine-grained rhyolite, thin beds of lapilli tuff, and volcanic breccia are common.

TABLE 14–1. STRATIGRAPHY OF THE LAURA BASIN AND SUB-LAURA BASIN ROCKS

LAURA BASIN	Early Cretaceous	Rolling Downs Group	50 m +	Mudstone with minor glauconitic sandstone	Marine
		Gilbert River Fm	350 m	Quartzose glauconitic sandstone	Shallow marine
	Jurassic	Dalrymple Sandstone	600 m	Quartzose sandstone, and conglomerate Minor siltstone, mudstone and thin lenses of coal in shale	Fluviatile
		Unconformity			
	Permian	Normanby Formation/ Little River Coal Measures	1000 m +	Sandstone, shale, coal Minor volcanics and impure limestone	Marginal marine?
		Unconformity			
HODGKINSON BASIN	Devonian–?Carboniferous	Hodgkinson Formation		Greywacke, slate, shale, volcanics. Minor limestone and conglomerate	
		Unconformity			
	Silurian–Devonian	Chillagoe Formation		Volcanics, limestone, chert sandstone and shale	
		Unconformity			
	Precambrian	Dargalong, Coen, and Holroyd Metamorphics		Schist, gneiss and quartzite	

The coal is folded, crushed, and faulted. The associated rocks of the formation are also folded but not cleaved; the folds plunge gently or moderately steeply. The formation is bounded by well-defined faults against the Hodgkinson Formation, and is overlain by unfaulted Jurassic sandstone. The beds are cut by numerous steep strike faults and several steep, northeasterly trending cross-faults. The pattern and style of the folds are consistent with deformation during down-faulting along the boundary faults. The cross-faults are younger than the strike faults.

The formation is about 700 to 1700 m thick; the sedimentary sequence in the southern outlier is interrupted by 200 to 300 m of rhyolite and possibly a greater thickness occurs in the central outlier. In the southern outlier, the rhyolite occurs between an upper freshwater or brackish coal-bearing sequence and a lower brackish or shallow-marine sequence.

Permian Strata Beneath The Laura Basin

Cabot–Blueberry Marina 1 penetrated 70 m of Permian rocks dipping at about 30° in the interval 1087 m to 1148 m. The beds comprise mostly grey black and brown, silty, carbonaceous shale with some coal laminae, with subordinate pale grey-green fine-grained microfractured silicified crystal (?) tuff, fine-grained pale grey sandstone and siltstones. *Glossopteris indica* is present in the basal part of the sequence. Minor glauconite was reported in the shale and sandstone.

Seismic exploration has indicated a thick sedimentary sequence, including Permian rocks south of the well, which occurs in zones striking north-northwest. These beds may be co-extensive with both the Normanby Formation and the Little River Coal Measures.

Environment of Deposition

The Upper Permian sediments accumulated on an even surface in a continental–lacustrine setting, probably under warm humid conditions. Marine fossils (*Thamnopora sp.*) indicate a paralic environment for part of the Permian and the sea probably encroached from the north. Volcanism was contemporaneous with sedimentation and extensive faulting. The Permian is preserved in narrow meridional rift valleys.

Maturity

The Permian and ?Triassic rocks in the Cape Grenville area have reached thermal maturity, but the Permian beneath the Laura Basin is supermature. Because these sequences have not been deeply buried, it has been postulated (Smart & Rasidi, 1979) that a high geothermal gradient probably existed during the Triassic in the Laura Basin.

Coal

The Little River Coal Measures have poor quality coals up to 7 m thick, and impure poor quality coal up to 30 m with high ash yield occurs in the Normanby Formation. Carbonaceous material and traces of coal are present in the Marina 1 and Breeza Plains 1 wells. Coal recovered during recent exploration is of poor quality and no commercial deposits have been discovered (AESIS, 1979; 426, 433).

Acknowledgements

The information used to make this compilation of the sub-Laura Basins' Permian coal deposits has been derived chiefly from Carr (1975), Day (1976), de Keyser & Lucas (1968), and Smart & Rasidi (1979).

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CHAPTER 15

Permian Coals of the Ovens Graben, Oaklands Area, N.S.W.

by
P.E. O'Brien

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Introduction

Most of the Permian coal-bearing sediments in a small area beneath the southeastern corner of the Murray Basin (Plate 2) lie in the centre of a Late Palaeozoic graben (the Ovens Graben) and are covered by 50 m or more of Triassic, Tertiary, and Quaternary sediments. This graben is one of a number of Middle to Late Palaeozoic sub-basins beneath the Murray Basin but, as yet, is the only one known to contain Permian coal (O'Brien, 1981).

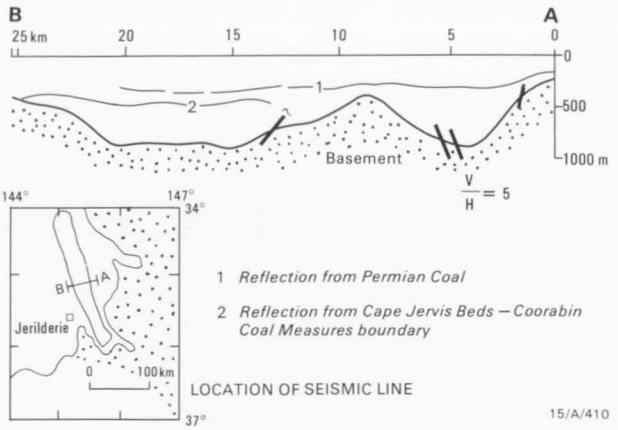

Fig. 15–1. Seismic cross-section of the Ovens Graben, after Palmer (1977).

Exploration History

Interest in the Permian coals of the Ovens Graben has waxed and waned since their discovery. A small colliery operated intermittently from 1917 till 1958 at Oaklands, and governments have drilled the area. The results of early drilling campaigns and geophysical work are summarized by Sturmfels (1950) and Thyer & Vale (1952). Renewed interest in the coals from 1970 onwards has led to extensive drilling by the New South Wales Department of Minerals and Energy and private companies. The results from this drilling were published by Palese (1974), Morgan (1977a, b), McMinn (1981) and Yoo (1981,a, b, c). Mcintyre (1975) re-assessed geophysical surveys and Palmer (1977) reported on two seismic traverses across the graben.

Structure

The Ovens Graben is 25 km wide and extends from Wangaratta in the south approximately to the Murrumbidgee River. Plate 2 shows the outline of the area in and around the graben with the Permian coal-bearing sediments. These sediments thicken from 171 m at its southern end to 957 m in the central part, before thinning slightly to the north (Krietz & Wiemer, 1963). Seismic traverses indicate that the graben's eastern and western margins are faulted. Figure 15–1 is based on a seismic section from Palmer (1977) shot at right angles to the graben axis. It shows the eastern boundary fault and gentle folding of the Permian parallel to the graben axis.

Stratigraphy

The Permian coal measures of the Ovens Graben were named the Coorabin coal measures by the Standing Committee on Coalfield Geology in New South Wales (1978). These Measures rest disconformably on the Early Permian, glaciomarine Urana Formation in the graben (O'Brien, 1986), and unconformably on older Palaeozoic rocks where the coal measures extend across the edges of the graben. The Triassic Jerilderie Formation and Tertiary Murray Basin sediments disconformably overlie the Coorabin coal measures (Table 15–1; Standing Committee on Coalfield Geology in New South Wales, 1978).

Thickness

There are three formations in the Coorabin coal measures totalling a maximum of 70 m in thickness: from bottom to top they are the Narrow Plains Formation, Loughmore Formation and Nowranie Creek Formation. Morgan (1977a, b) showed that these formations are of Late Permian age with the Narrow Plains Formation containing a Lower Stage 5 microflora, the Loughmore Formation an Upper Stage 5 microflora and the Nowranie Creek Formation a *Protohaploxypinus reticulatus* assemblage. Each formation is separated from that which overlies it by an unconformity. The Urana Formation beneath the Coorabin coal measures are much older and has an Early Permian Stage 3 microflora.

Coal Seams

Two coal seams are present in the Coorabin coal measures: the Coreen Creek Coal Member of the Loughmore Formation and the Lane's Shaft Coal

TABLE 15–1. STRATIGRAPHY OF THE COORABIN COAL MEASURES

Palynological Zone/Stratigraphic Age	*Stage*	*Thickness Unit*	*(in m)*	*Lithologies*
Mid-Triassic	Unit Tr 3B	Jerilderie Formation	0–219	White to grey quartzose sandstone, conglomerate and mudstone
		UNCONFORMITY		
Upper Permian	Protohaploxypinus reticulatus assamblage	Nowranie Creek Formation	0–7	Grey to pink claystone
		UNCONFORMITY		
Upper Permian	Upper Stage 5	Coreen Creek Coal Member	0.5–1.5	Coal and carbonaceous mudstone
		Loughmore Formation	7–18	Conglomerate grading up into sandstone and coal
		UNCONFORMITY		
Upper Permian	Lower Stage 5	Lanes Shaft Coal Member	3.5–19	Dull, uniform coal with fusain lenses and several mudstone bands
		Narrow Plains Formation	15–35	Conglomerate and sandstone grading up into mudstone
		UNCONFORMITY		

Member of the Narrow Plains Formation (Standing Committee on Coalfield Geology in New South Wales, 1978: Table 15–1). The Coreen Creek Coal Member is thin and discontinuous throughout most of the subcrop, though it reaches 4.8 m in the northern end of the graben (Yoo, 1982). The Lane's Shaft Coal Member, however, is up to 18 m thick in the Coorabin–Oaklands area and over 3 m across most of that area (Palese, 1974). It has also been recognised in the northern area of Coorabin coal measures subcrop, up to 12 m in thickness (Yoo, 1982).

The Lane's Shaft Coal Member is buried beneath 200 to 350 m of sediment in the northern end of its subcrop area (Yoo, 1981), but the overburden reduces to a minimum of 60 m near Oaklands. Palese (1974) estimated that an area of 90.6 km^2 has ratios of less than 5 to 1. This overburden consists of unconsolidated Cainozoic sediments which include some lignite beds.

Coal-Forming Environment

Morgan (1977a, b) showed that each of the formations making up the Coorabin coal measures represents a single point-bar sequence deposited by meandering streams, with coarse pebbly sandstones in channels at the base of the formations which fine-up through point-bar sandstones into fine-grained overbank sediments. The coal seams were originated as peats in backswamps on the alluvial plains. The small thickness of the Coorabin coal measures, considering the age range from mid to latest Permian, indicates very slow, intermittent subsidence during their deposition. The distribution of the coal measures suggest that they are an erosional remnant of an alluvial sequence that covered a large part of the Murray Basin. This remnant was preserved by compaction-induced subsidence over the Ovens graben and by minor faulting. Similar coal measures may be preserved elsewhere beneath the Murray Basin though extensive drilling has failed to find them.

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CHAPTER 16

Tasmania Basin

by
P.E. O'Brien

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Introduction

In Tasmania, Permian coal-bearing rocks are part of the thin, sub-horizontal Carboniferous to Triassic Parmeener Supergroup (Clarke, & others 1976). The distribution of this Supergroup is shown on Plate 2 and on Fig. 16–1. Some mining of Permian coal took place in the Mersey Coalfield, and Mount Cygnet and Preolenna areas.

Previous Literature

Major accounts of the Parmeener Supergroup were presented by Banks (1962), Jennings & Williams (1967), and Clarke & others (1976). The distribution of Permian and Triassic coals and mining operations were discussed in some detail by Hills & others (1922), and reviewed by Jennings & others (1967) and Noldart (1975).

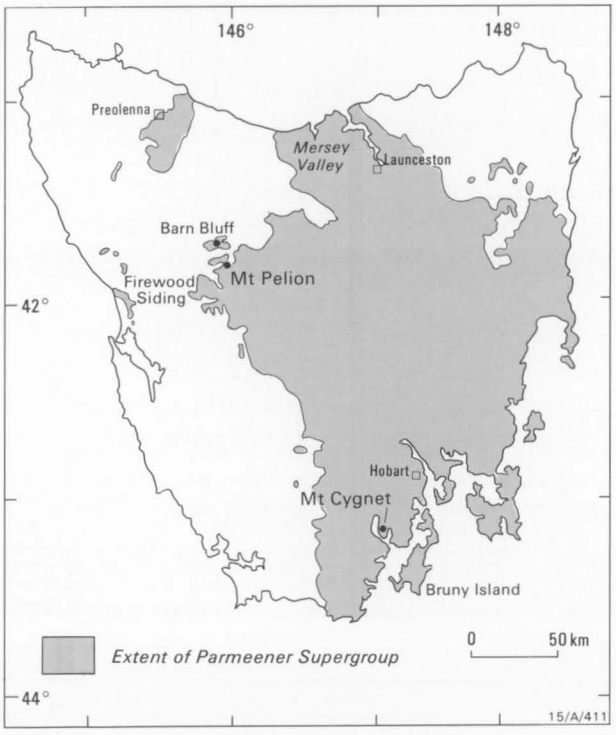

Fig. 16–1. Distribution of the Parmeener Supergroup and occurrences of Permian coal measures.

Permian Stratigraphy

Terminology

The Permian Parmeener Supergroup can be divided into four sequences (Clarke & others, 1976), each comprising several formations (from the base): the Lower Marine, the Lower Freshwater, the Upper Marine, and the Upper Freshwater Sequence (Fig. 16–2).

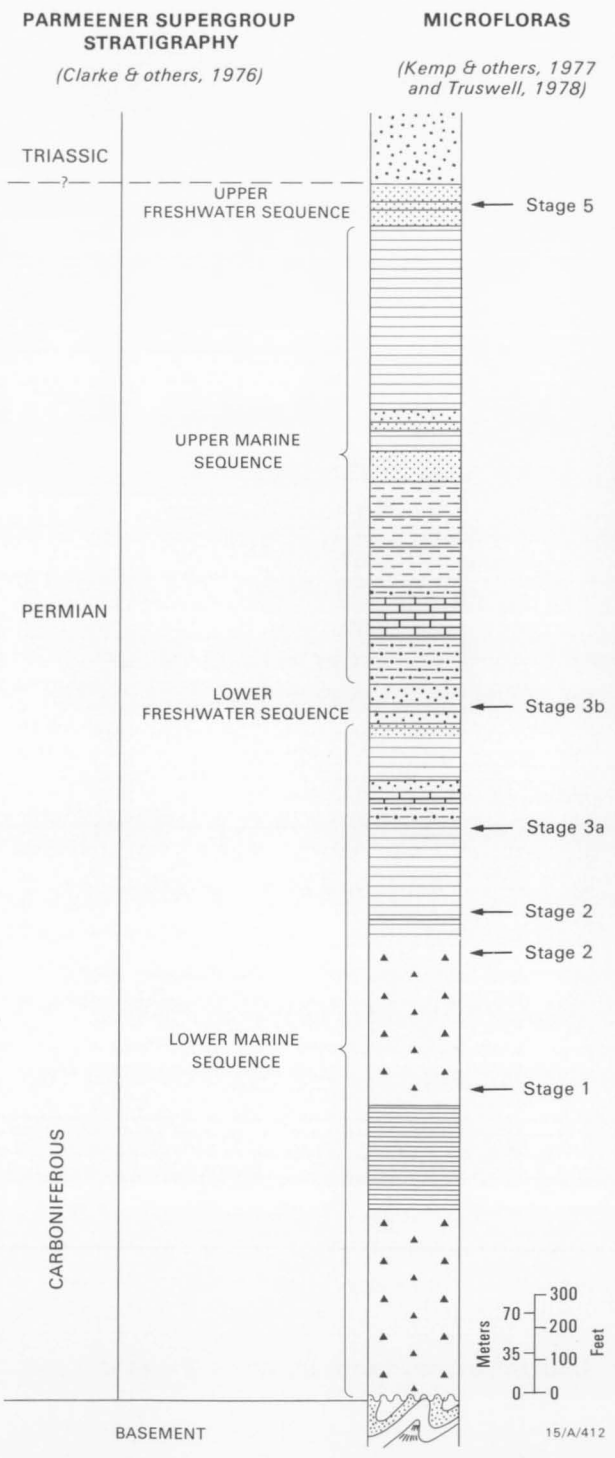

Fig. 16–2. Permian stratigraphy of the Parmeener Supergroup.

Age

The lower part of the Parmeener Supergroup ranges from Late Carboniferous, as indicated by a Stage 1 microflora, to Late Permian, as shown by

an Upper Stage 5 microflora (Kemp & others, 1977). Clarke & others (1976) offered a detailed zonation of the marine units using invertebrates. Faunas II to IV of Dickins (1964) are present in the Upper Marine Sequence (Clarke & others, 1975; Clarke & Banks, 1975). The correlations between the Parmaneer Supergroup and other Permian basins of eastern Australia are given in Plate 3.

Lower Marine Sequence

The lowermost rocks of the Parmeener Supergroup are diamictites, sandstones, conglomerates, laminated mudstones, and rare oil shales beneath the western half of the Tasmania Basin (Banks, 1962). These lithologies vary from a few metres to 600 m thick. The diamictites are subglacial tillites deposited during the Late Palaeozoic glaciation of Gondwana, probably by a wet-based ice sheet (Carey & Ahmad, 1961). Associated with the tillites are debris flow deposits and various proglacial sediments. Rhythmically bedded claystones at one locality have a Stage 1 microflora (Clarke & others 1975), and Truswell (1978) reported Stage 1 and Stage 2 microfloras in diamictites.

Above the diamictites are mudstone, sandstone and limestone units of the Quamby and then of the Golden Valley Groups (Banks, 1962; Fig. 16–2). Both the Quamby and Golden Valley Groups contain ice-rafted boulders and marine invertebrates fossils. Truswell (1978) found Stage 3a microfloras in these Groups.

Lower Freshwater Sequence

The Mersey Group consists of quartzose sandstones and shales up to 60 m thick, with coal seams and oil shales in a few places. Truswell (1978) found Stage 3b microfloras in the Mersey Group, suggesting correlation with the Reids Dome Beds rather than with the Greta coal measures, as was thought by earlier workers (Hills & others, 1922).

Coal seams are known in three areas (Fig. 16–1). The most northerly is in the valley of the Mersey River where a number of small collieries operated until 1960. Two seams are present, the thickest reaching 60 cm (Noldart, 1975). At Preolenna, four seams are present and one thin seam at Barn Bluff (Gee, 1977; Collins & others, 1981).

Upper Marine Sequence

The Upper Marine Sequence is highly variable, with calcareous siltstone, limestone, sandstone, and mudstone units. Pronounced facies variations cause stratigraphic terminology to vary from place to place. Banks (1962) groups the various units into the Cascade Group, the Malbina Formation, and the Ferntree Group; with the Cascade Group conformably overlying the Mersey Group. Ice-rafted clasts are present throughout the Upper Marine Sequence and shelly fossils are locally abundant.

Upper Freshwater Sequence

The Upper Freshwater Sequence is known as the Cygnet coal measures. They consist of cross-bedded, quartzose sandstones and siltstones up to 100 m thick, distributed widely across eastern Tasmania (Banks, 1962). They conformably overlie the Ferntree Group and it, in turn, is covered by Triassic fluviatile sediments. This upper boundary is conformable in some places and disconformable in others. The Cygnet coal measures contain *Glossopteris*, *Vertebraria* and an Upper Stage 5 microflora (Banks, 1962; Kemp & others, 1977). Thin, discontinuous coal seams have been reported from many areas of outcrop, but only at Mount Cygnet, 50 km south of Hobart, has coal been mined. At Mount Cygnet, two seams are present, the thickest reaching 90 cm (Hills & others, 1922; Noldart, 1975).

Structure and Igneous Intrusions

The Parmeener Supergroup constitues a sheet-like sedimentary deposit that formed on a shelf. Large-scale folding was limited to broad north-northwesterly warping during deposition of the Upper Marine sequence. There are also some small tectonic folds with limbs dipping 10° or less and drape folds over bedrock topography (Banks, 1962). This gently folded sedimentary sequence is cut by many steeply dipping faults which rarely have displacement exceeding 100 m. These small faults restricted the size of the small underground workings in the two areas mined, and local increases in dip associated with faults also caused extraction difficulties (Hills & others, 1922).

The Parmeener Supergroup is intruded by interconnecting sheets of dolerite up to 450 m thick, forming an almost continuous body of dolerite across eastern Tasmania. Steeply dipping dykes also cut the Parmeener Supergroup.

Deposition of the Coal Measures

The Permian coal-bearing sediments of Tasmania are part of a platform sequence which is mostly marine. The coal-bearing units, however, are intervals of fluvial and deltaic deposits that prograded across the platform during periods of either low relative sea level, high sediment input, or slightly slower subsidence of the platform. Banks (1962) considered changes in subsidence rates as the most important factor governing Permian transgression and regression across Tasmania.

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CHAPTER 17

Correlation of the Permian Coal Measure Sequences of Eastern Australia

by
A.T. Brakel[1]

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1 The portion of this chapter dealing with the correlation of the upper coal measures has been published in *BMR Journal of Australian Geology & Geophysics* (1986), 10, 17–22.

Introduction

Fundamental to any regional appreciation of the sedimentary and tectonic evolution of the coal basins of eastern Australia is reliable correlation of the sequences they contain. Without an accurate knowledge of the correspondence of geological events in one basin with those in other basins, it would be difficult to get more than a blurred overview of the regional pattern of sedimentation, basin subsidence, and tectonism, and therefore of how the basins originated and developed. This in turn is relevant to the location, depth, quality, type, and rank of coal in poorly known areas. The correlation of some sequences with those elsewhere in the region is still less firm than desired, and in some instances is subject to controversy. Nevertheless, in correlating the upper coal measures between the Sydney and Bowen Basins, which was particularly problematical because of thick units without marine fossils, significant progress has been made since this study began.

Previously published correlations of the Permian successions conflict markedly with each other. Figure 17–1 shows three recent correlations of the Permian in the Sydney, Gunnedah and Bowen Basins. Two of these, by Dickins (1976) and McClung (1978), are based on marine macrofossils, but nevertheless disagree. In this report, the correlations of Dickins (1976) have been used for most of the marine sequences. However, the Dickins correlation of the base of the Bandanna and Fair Hill Formations with the base of the Tomago Coal Measures is not founded on any faunal evidence, but on the assumption that coal measure deposition started at the same time in both regions. This is now known to be incorrect. A third correlation, by Rigby & Hekel (1977), is based on palynology and disagrees with the other two.

The correlation chart used here for the Permian coal basins of eastern Australia is presented as Plate 3.

Coal Measure Groupings

The stratigraphy of the Permian System in the marginal basins (Bowen, Gunnedah, Sydney and Tasmania Basins) consists of broad alternations of marine sediments and coal measures, and a similar situation exists in the intracratonic Cooper Basin, where coal measures alternate with deposits formed in inland sea or lacustrine settings. It is, therefore, convenient to divide the coal measures regionally into three broad groupings according to age. Similar schemes have previously been used in individual basins. The Sydney Basin has its "Lower

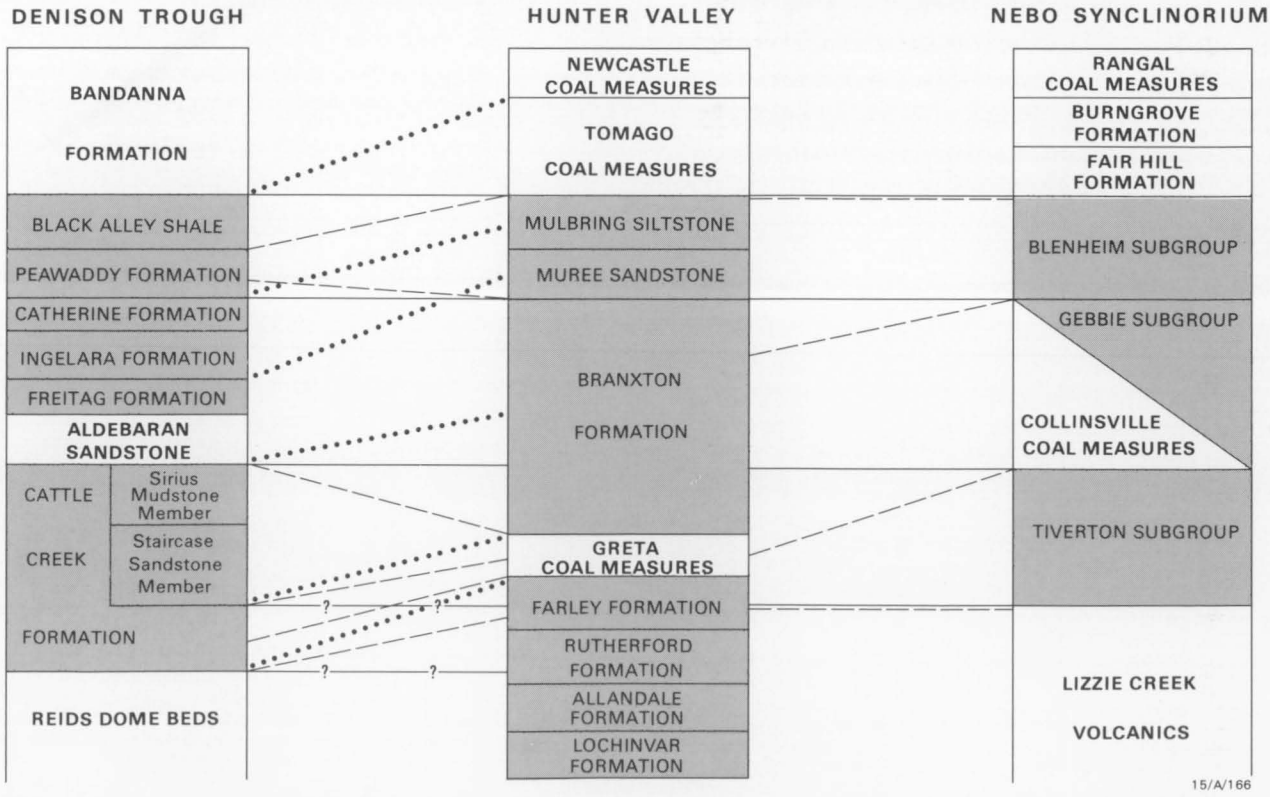

Fig. 17–1. Examples of published correlations of the Permian sequences of the Sydney and Bowen Basins; after Dickins (1976)–solid lines; McClung (1978)–dashed lines; and Rigby & Hekel (1977)–dotted lines.

Coal Measures" (Greta Coal Measures) and "Upper Coal Measures" (Tomago and Newcastle Coal Measures, and their equivalents). In the Bowen Basin, a four-fold grouping has been used (Goscombe & others, 1976) (Table 17–1).

TABLE 17–1. COAL MEASURE GROUPINGS AS USED IN THIS REPORT COMPARED TO USAGES IN THE SYDNEY AND BOWEN BASINS

This Report	Sydney Basin	Bowen Basin
		Group IV coals
Upper coal measures	"Upper Coal Measures"	Group III coals
Middle coal measures	"Lower Coal Measures"	Group II coals
Basal coal measures	—	Group I coals

The oldest of the groupings used in this report, the *basal coal measures*, contains the Reids Dome beds and its equivalents. It is not called the "lower coal measures", in order to prevent possible confusion with the Greta Coal Measures of the Sydney Basin, to which this now obsolete name has been applied. The *middle coal measures* comprise the Greta Coal Measures, Collinsville Coal Measures, and their approximate equivalents. The *upper coal measures* includes the Tomago and Newcastle Coal Measures, and their regional contemporaries. The three groupings can be diachronous, and time-overlaps can occur between them from one basin to another.

Basal Coal Measures

In the western part of the Bowen Basin, the basal coal measures are represented by the Reids Dome beds in the Denison and Arbroath Troughs, and the immediately adjacent areas. In the sub-Surat portion of the Bowen Basin, there are small subcrops of unnamed coal measures, marginal to marine rocks, which are correlated with the Reids Dome beds on the basis of palynology (see Chapter 8). In the eastern and northern portions of the Bowen Basin, the thick sequence of volcanics referred to, respectively, as the Camboon Andesite and Lizzie Creek Volcanics, were erupted at the same time; the basal coal measures are represented only by rare coal-bearing lenses (such as the Crush Creek Coal Measures) in the Lizzie Creek Volcanics. Presumed equivalents east of the Bowen Basin are the freshwater Carmila beds containing very minor coal. Palynological work has revealed that the coal-measure sediments at the base of the sequence in the Wolfang Basin are of Reids Dome age (Foster, 1978; Carr, 1980), and the coal measures of the Karin Basin are probably also correlatives (Cook & Taylor, 1979).

The equivalents of the Reids Dome beds in the Galilee Basin are recognized as the Aramac Coal Measures, as based on palynology (Kemp & others, 1977) and stratigraphic position. In the Cooper Basin, the Patchawarra Formation is assigned to the basal coal measures because the lower portion is contemporaneous with the Reids Dome beds, but there is a complication in that coal-measure deposition continued uninterrupted in the Patchawarra after Reids Dome time, so that the uppermost part of the formation is temporally equivalent to part of the Greta Coal Measures of the middle coal measures.

The microfloras found by Truswell (1978) in the Mersey Group of the Tasmania Basin show that this unit is also equivalent to the Reids Dome beds.

The only coal from the Sydney Basin included in the basal coal measures is Garretts Seam at the base of the Permian, north of Newcastle. The Clyde and Yarrunga Coal Measures of the southern Sydney Basin are in part contemporaneous with the Reids Dome beds, as some of the lenticular seams have a Stage 3 microflora (Herbert, 1980), but other seams are of Greta age. The assignment of these lenticular units to a coal-measures grouping is difficult, and their inclusion with the middle coal measures, rather than the basal coal measures, is arbitrary. In the Alum Mountain Volcanics of the Myall Syncline, there is a possible lens of coal measures which would belong with the basal coal measures if the lens were conformable with the volcanics.

At this time, volcanics were also being erupted in the Gloucester Basin (Stroud Volcanics), the upper Hunter Valley (Gyarran Volcanics), and in the Gunnedah area (Boggabri Volcanics). The Gyarran Volcanics apparently extend in the subsurface southwards to the Kurrajong Heights 1 and Kirkham 1 bores (Mayne & others, 1974). Elsewhere in the Sydney Basin, sedimentation was marine.

Middle Coal Measures

The stratigraphic interval of the middle coal measures is exemplified by the Greta and Collinsville Coal Measures, respectively, of the northern Sydney and northern Bowen Basins. The Greta Coal Measures lie within the Fauna II biozone (Dickins, 1968), whereas the Collinsville Coal measures occur within Fauna III (Dickins & others, 1964). It was once considered possible that the base of the Collinsville might overlap in time with the top of the Greta, but this is now discounted (J.M. Dickins, pers. comm.).

The Clyde and Yarrunga Coal Measures lenses of the southern Sydney Basin are also included with the middle coal measures, as explained in the previous section. The equivalents of the Greta Coal

Measures in the Gunnedah Basin are the Leard and Maules Creek Formations of the Nandewar Group. The Markwell Coal Measures of the Myall Syncline are now known to be of early Greta age (McMinn, 1987). The Ashford Coal Measures of the Ashford Basin are regarded as a Greta-age deposit, because of the evidence of plant fossils and an overlying glacio-marine unit lithologically similar to the Maitland Group of the Hunter Valley (Britten, 1975).

In the Bowen Basin, equivalents of the Collinsville coal Measures occur along the western margin of the basin near Rugby Bore, approximately 100 km north of Capella, and as the Aldebaran Sandstone of the Denison Trough. This sandstone is a fluvio–deltaic wedge with a few sporadic coal lenses, but does not have any economic coal; correlation with the Collinsville Coal Measures is definite because both units lie in the Fauna III zone (Dickins & others, 1964). The Blair Athol Coal Measures have been found by palynology to be of similar age (Foster, 1979). To the east in the Calen Basin, the Calen Coal Measures are presumed to be equivalent to the above units on lithological grounds, but other evidence is lacking.

On the Springsure Shelf and in the Galilee Basin, the Colinlea Sandstone has been regarded on lithological grounds (Mollan & others, 1969; Gray, 1976) as the lateral equivalent of the interval from the "middle conglomerate member" of the Aldebaran Sandstone to the Catherine Sandstone inclusive. Accordingly, it is grouped with the middle coal measures. The correlation is said to be based also on palynological evidence, but it is not yet clear how this evidence is affected by the hiatus now recognized at the base of the lower stage 5 and Fauna IV zones. If it is proven that the Colinlea Sandstone is higher in the sequence than previously supposed, it will have to be transferred to the upper coal measures. In the northern Galilee Basin, coal measure deposition continued uninterruptedly from the Colinlea Sandstone into the Bandanna formation, so that the boundary between the two has not been determined.

The coal measure units in the Cooper Basin assigned to the middle coal measures are the Epsilon Formation and the Daralingie beds. This correlation is on palynological grounds (Kemp & others, 1977).

The middle coal measures grouping is broader than the others, and its components are not necessarily contemporaneous. They range from the Clyde Coal Measures, overlapping in time with the top of the basal coal measures, to the Daralingie beds, which contain a lower stage 5b microflora and come close to overlapping with the base of the upper coal measures in the Sydney Basin. The top of the Colinlea Sandstone probably does overlap with the latter. In between these two extremes lie the Greta Coal Measures and the younger Collinsville Coal Measures.

The central, eastern and southern parts of the Bowen Basin, the central, western and southern parts of the Sydney Basin, and the Tasmania Basin, were entirely marine during this interval, while other areas recorded no net deposition.

Upper Coal Measures

The units designated as upper coal measures in the Sydney Basin are the Late Permian Tomago and Newcastle Coal Measures of the lower Hunter region, the Singleton Supergroup in the upper Hunter region, and the Illawarra Coal Measures of the southern and western parts of the basin. The equivalent in the Gunnedah Basin north of the Hunter Valley is the Black Jack Formation. In the Bowen Basin, the upper coal measures embrace the entire sequence from the base of the German Greek Formation to the top of the Rangal Coal Measures, as well as lateral coal-bearing equivalents (the Baralaba, Bandanna and Tinowan formations). They therefore consist of both the Group III and Group IV coals of Goscome & others (1976), which are distinguished by being respectively below or above the marine to brackish incursion in the Burngrove Formation. The broad correlation across these three basins can be made because all the units lie above the base of the Fauna IV biozone, but more detailed correlation of individual formations between basins poses more of a challenge and is discussed separately in the next section.

The Bandanna Formation in the Galilee Basin is physically continuous and contemporaneous with the Bandanna of the Denison Trough.

The Gloucester Coal Measures of the Gloucester Basin is placed in the upper coal measures on palynological evidence (see Chapter 5). Similarly, the microfloral contents of the Toolachee Formation (Cooper Basin), Coorabin Coal Measures (Oaklands Basin/Ovens Graben), Cygnet Coal Measures (Tasmania Basin), Olive River Basin Coal Measures, and the Mt Mulligan Coal Measures also show that they lie in the same stratigraphic interval.

The Permian sub-Laura Basin sequence is tentatively allocated to the upper coal measures on the basis of plant macrofossils.

Coal formation in eastern Australia was more widespread during the latest Permian than in any previous time. The basins which lack upper coal measures (Myall Syncline, Ashford, Calen and Blair Athol basins) also lack any other sediments of that age. These are all small basins, and the absence of any latest Permian sediments can be due either to non-deposition or to erosional removal.

Formational Correlation of Upper Coal Measures Between the Sydney and Bowen Basins

An adequate understanding of the geological controls on the deposition of the economically important upper coal measures requires not just the broad correlation discussed in the previous section, but interbasinal correlation of the formations. This is necessary for constructing contour maps of the Newcastle Coal Measures equivalents, and to elucidate the effects of tectonic and eustatic sea-level changes on sedimentation. The critical correlation is that between the Sydney/Gunnedah and Bowen Basins, the exposed portions of which are separated by a thick Mesozoic sequence overlying poorly known Permian. None of the three published correlations shown in Fig. 17–1 has much to offer about the upper coal measures interval, as at the time of publication there was little firmly based information on which to correlate these largely terrestial sequences; the normal correlation methods were inadequate for the task. Marine macrofaunas are, of course, absent from terrestial sequences, and the interbedded marine to brackish incursions are usually devoid of body fossils, except for rare individuals of no value for the degree of stratigraphic resolution required. This interval in the Bowen Basin has not yet been examined for foraminifera, except for the top portion of the MacMillan Formation, which proved barren (V. Palmieri, 1981, pers. comm.); nor have plant megafossils been researched in sufficient detail to tell if they would be useful in the time scale of the upper coal measures. Almost no isotopic dating has been carried out so far. When this study commenced, palynology did not appear to have a fine enough time resolution, and the question was whether palynozones were influenced by periglacial climatic zones and hence were diachronous (Brakel, 1982a,b). These doubts have now been allayed by the recognition of the significance of the hiatus between Faunas III and IV, allowing the correction of the stratigraphic levels of palynozones in Queensland, and by work on the microfloras of the Sydney and Gunnedah Basins (McMinn, 1980, 1982). In the meantime, another correlation method using global sea-level cycles appeared promising and was investigated. This has provided good results consistent with and complementary to the amended palynological correlations.

Eustasy in the Late Permian

The concept of sea-level changes

Global sea-level cycles were first recognized by petroleum geologists from seismic traverses across various continental shelves around the world, where it was found that unconformities formed and sedimentary sequences deposited during highstands and lowstands of sea level occur in the same stratigraphic positions regardless of which shelf was studied (Vail & others, 1977). Extension of the work onshore showed that sea-level cycles, which fluctuated a couple of hundred metres above and below present sea level, had been operative at least since the Cambrian (Fig. 17–2a). The broad cycles have been described in greater detail from the Triassic onwards, as for example in the sea-level curve for the Tertiary (Fig. 17–2b). The effect of local tectonics can modify the general pattern, but the global cycles can usually be identified from field evidence and comparison with other regions. As well as being applied to correlation on continental shelves world-wide, the detailed cycles have been used successfully in the Mesozoic of the Surat Basin (Exon & Burger, 1981), and for correlating the New Zealand Tertiary stages with the international ones (Loutit & Kennett, 1981).

Such detail has not yet been published for the Permian, but if short-duration global highstands occurred then, as they did in later periods, such incursions can be identified and used as near-timelines within coal measure sequences separated by great distances. Mörner (1981) has argued that the sea-level cycles are not global in effect, but are caused by changes in the shape of the geoid and migrate with time as large latitudinal waves 50°–60° wide. If this is correct, it will not invalidate the technique for correlation between the Permian of the Sydney and Bowen Basins, because the latitudinal difference involved is only 15° and any time difference between sea-level highstands in the two regions will be less than 5 Ma, which is below the threshold of time-resolution currently possible.

To qualify as an unambiguous global eustatic change, suitable for correlation, a marine incursion should be of wide areal extent. Also, there should be no significant contemporary tectonism, or the effects of the two processes could be confused. For example, the Collinsville Coal Measures of the Bowen Basin cannot be correlated with the Greta Coal Measures of the Sydney Basin as necessarily representing the same eustatic lowstand, because both units record contemporary tectonism in the form of many thick, extensive alluvial fan conglomerates. (Palaeontology shows that the two units are in fact not contemporaneous.)

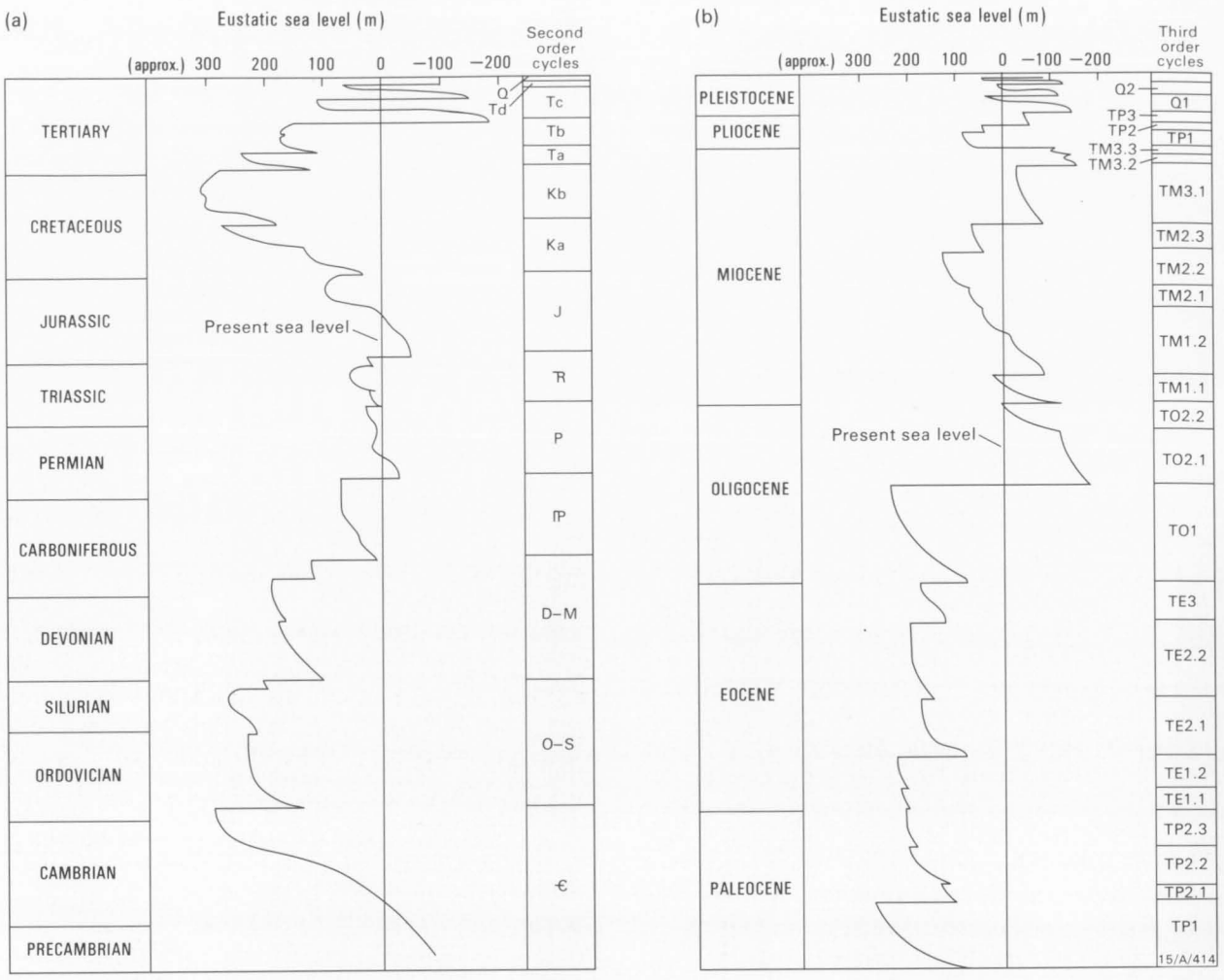

Fig. 17–2a. Generalized (second order) global sea level changes for Phanerozoic time, after Vail & others (1977). Horizontal scale after Loutit & Kennett (1981).

Fig. 17–2b. Detailed (third order) sea level cycles for the Mesozoic and Cenozoic, after Vail & others (1977).

A marine or brackish incursion can usually be recognised by the presence of sporadic body fossils and abundant burrowing. Burrows are most common in marine or paralic environments, but are not confined to them (Heckel, 1972), so that if marine macrofauna are absent, other evidence, such as mud flasers, lenticular bedding, acritarchs, and foraminifera, is required to confirm tidal activity or saline conditions.

Sydney–Gunnedah correlation

Examination of the Late Permian upper coal measures of the Sydney, Gunnedah, and Bowen Basins shows that there were two widespread incursions in each basin. In the Sydney Basin, these are the Kulnura and Dempsey incursions, represented respectively by (1) the Kulnura Marine Tongue and its lateral equivalents, the Bulga and Archerfield Formations (upper Hunter Valley), and Erins Vale Formation (South Coast); and (2) the Dempsey Formation and its equivalents, the Denman Formation (upper Hunter Valley), Baal Bone Formation (Western Coalfield), and Bargo Claystone (South Coast).

The deposits of the Kulnura incursion, with a shelly fauna and abundant burrowing, are overlain in most places by a coal seam that contains a distinctive section of dull coal (the Bayswater and Woonona Coal Members). This characteristic couplet of marine to brackish sediments overlain by dull coal can be readily recognised in the Gunnedah Basin as the Arkarula Sandstone Member and Hoskissons Coal Member (Brakel, 1982a,b; Weber & others, 1982; Beckett & others, 1983). In the Gloucester Basin, the incursion is identified as the burrowed interval below the Bowens Road Coal.

The deposits of the Dempsey incursion, higher in the sequence, usually underlie a marker sandstone unit (the Waratah Sandstone and equivalents). No marine macrofossils are present, but the unit contains acritarchs and a marine microfauna (McMinn, 1982a), and is extensively burrowed. The Dempsey incursion is represented in the Gunnedah region by a burrowed unit in the interval below the Goran Conglomerate Member, but it is much thinner (5 m or less) than the Sydney Basin equivalents (Beckett & others, 1983), and in some bores may be absent.

These correlations between the Sydney and Gunnedah Basins are supported by palynological evidence. The Kulnura–Arkarula incursion contains the first appearance of *Dulhuntyspora parvithola*, which marks the boundary between lower stage 5 and upper stage 5 (McMinn, 1980, 1982b). The Dempsey incursion is a little later than the first appearance of *Microreticulatisporites bitriangularis*, which marks the base of the *M. bitriangularis* subzone (upper stage 5c) (McMinn, 1980, 1982b).

Sydney–Bowen correlation

Like their counterparts in the Sydney and Gunnedah Basins, the upper coal measures of the Bowen Basin also display evidence of two widespread marine to brackish incursions. These are the MacMillan and Burngrove incursions, represented respectively by (1) the MacMillan Formation and its lateral equivalent, the Black Alley Shale, and (2) the lower, intensely burrowed portion of the Burngrove Formation. The MacMillan Formation and Black Alley Shale contain burrowing and rare shelly fossils, and the latter also the P3c acritarch zone. Interpretation of the lower Burngrove Formation is based on the intense burrowing and minor lenticular bedding. Both incursions are widespread, but they appear not to have reached the far north of the Bowen Basin. A marine to brackish interval equivalent to the Burngrove incursion within the Bandanna Formation of the Denison Trough has not been well established, but an interval with some burrowing and bioturbation has been noted in the formation on the adjacent Springsure Shelf by Brakel (1983) and Anderson (1976).

The most obvious and simplest model correlating the Sydney and Bowen sequences equates the Kulnura incursion with the MacMillan incursion, and the Dempsey incursion with the Burngrove incursion (Fig. 17–3). It has the added attraction of having deposition of upper coal measures start at about the same time in both basins, which can be readily explained by a global drop in sea level

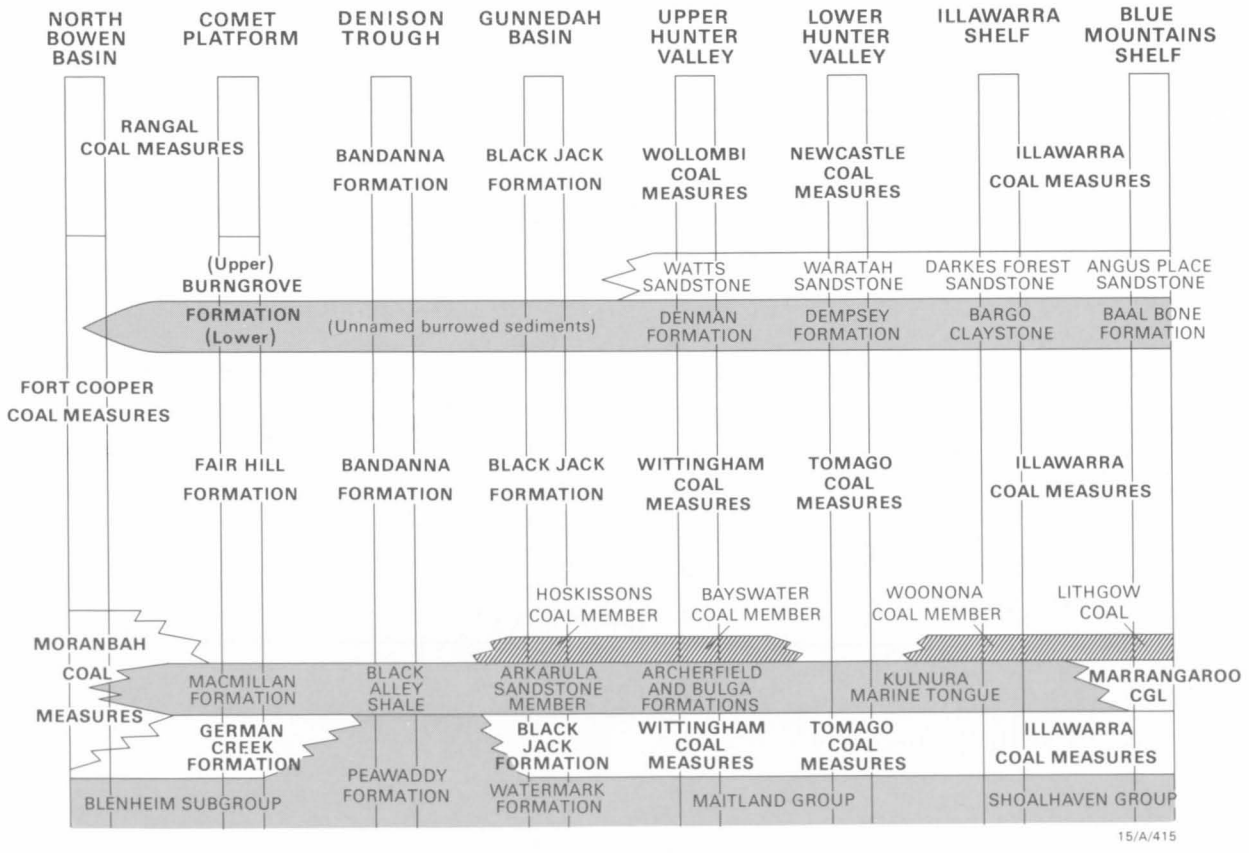

Fig. 17–3. Correlation model equating the Kulnura and MacMillan incursions between the Sydney, Gunnedah and Bowen Basins. Major marine units are stippled, minor local marine intercalations are not shown.

initiating deltaic progradation along the eastern seaboard. Consequently, it was the model favoured earlier (Brakel, 1982a,b), but there are now two reasons against it. The first is evidence that the Kulnura incursion in the Sydney and Gunnedah Basins, and the Burngrove incursion in the Bowen Basin, were probably caused by tectonism. The lateral equivalent of the Kulnura Marine Tongue in the Western coalfield of the Sydney Basin is the non-marine Marrangaroo Conglomerate. It underlies the Bayswater Coal Member-equivalent, the Lithgow Coal, and extends along the western basin margin for about 200 km as an alluvial fan apron. This deposit is not what would be expected in response to lower relief resulting from a eustatic sea-level rise. The conglomerate could only be consistent with a eustatic rise if it represents a basal transgressive deposit overlain by a marine interval wherever lower-energy marine conditions existed. But no such relationship is known. Furthermore, the Marrangaroo Conglomerate records fluvial rather than nearshore marine deposition (Bradley, 1980; Bembrick, 1983). The Kulnura Marine Tongue and Marrangaroo Conglomerate occur together in the AOG Kirkham 1 well, where a poorly sorted sandy, silty unit (unit Km 26 of Raine, 1969, at 1003–1058 m), containing mud flasers and bioturbation, coarsening upward from sandy siltstone to medium sandstone and topped by a thin coal, is overlain by a conglomeratic unit (unit Km 25 of Raine, 1969, at 979–1003 m). This is the reverse of what would be produced by a eustatic rise in sea level and must therefore be a response to tectonism.

A similar sequence exists in Shell Dural 1 (1178–1372 m), where a dominantly siltstone sequence is overlain by sandstone (units D11 and D10 of Hawkins & Ozimic, 1967). The siltstone contains arenaceous foraminifera and probable burrowings, and, given its stratigraphic level, it can be correlated confidently with the Kulnura Marine Tongue. The overlying medium-grained sandstone contains some pebble layers and could represent either the distal fan delta of the Marrangaroo Conglomerate or a beach-zone facies. Minor coal in the sandstone could have been deposited in coastal swamps fringing the fan delta or in back-beach marshes. Rare patches of anhydrite may record short-lived, local evaporitic conditions. The Kirkham 1 sequence, and possibly that in Dural South 1, records the Kulnura marine incursion being overridden by a prograding fan delta of Marrangaroo Conglomerate. Recently, Havord & others (1984) have reported finding the Marrangaroo Conglomerate overlying the Kulnura Marine Tongue over much of the western and southern Sydney Basin, thus confirming the interpretation of the Kirkham 1 and Dural South 1 sequences.

The absence of the Kulnura Marine Tongue west of the Lapstone Monocline strongly suggests that the Lapstone basement fault (Harrington & Brakel, 1981) was active at the time, the central and eastern parts of the Sydney Basin being downthrown. The subsidence allowed the sea to cover the basin up to the Lapstone line, while on the emergent Blue Mountains Shelf the drop in base level caused the alluvial fan of the Marrangaroo Conglomerate to form in response. The fan eventually reached the sea as a fan delta at Kirkham 1. Farther north, in the Mount Coricudgy area, bioturbation and marine influence have been observed in the Marrangaroo Conglomerate (G.M. Bradley, pers. comm.) near a hinge-line and Landsat lineament west of the Lapstone line, indicating that the sea reached farther west in this area and that tectonic activity occurred on more than one basement fault.

Deposition of the Burngrove Formation in the Bowen Basin was also accompanied by substantial tectonic activity. Tuffs from contemporaneous volcanism are abundant, and, in the far north of the basin, conglomerates are common in the upper part of the Fort Cooper Coal Measures, which is equivalent to the Burngrove Formation. The conglomerates have been intersected in GSQ Hillalong NS 1 and 2 bores; they were laid down in alluvial fans advancing towards the southeast, parallel to the basin axis, and some contain clasts of cobble size (Koppe, 1973). Conglomerate also occurs at the same level in GSQ Drake NS 16 and 17 (Koppe, 1976). It seems likely then that the Burngrove incursion also had a tectonic cause.

A second line of evidence against a Kulnura–MacMillan correlation is provided by palynology. The base of the Black Alley Shale, equivalent to the MacMillan Formation (Brakel, 1983), marks the first appearance of *Microreticulatisporites bitriangularis* and the beginning of the upper stage 5c palynozone (Rigby & Heckel, 1977). This same species first appears in the Sydney and Gunnedah Basins a little below the Dempsey Formation (McMinn, 1980, 1982b). If diachroneity of palynozones between the Sydney and Bowen Basins is no longer a tenable hypothesis, then the MacMillan and Dempsey incursions are contemporaneous.

The result is an alternative Sydney–Bowen correlation model (Fig. 17–4), which equates the MacMillan incursion with the Dempsey incursion, has the Kulnura incursion equivalent to part of the Blenheim Subgroup (Peawaddy and Maria Formations), and places the Burngrove incursion at a level within the interval corresponding to the Newcastle Coal Measures. Coal measure deposition in the Sydney Basin began markedly earlier than in the Bowen Basin. The only global sea-level rise that can now be unambiguously identified in upper coal measures time is the MacMillan–Dempsey incursion, which is the only marine transgression to affect the whole region simultaneously and not be accompanied by significant tectonic activity. There are no conglomerates or volcanogenic rocks associated with the Dempsey Formation in the Sydney and Gunnedah Basins, nor are there conglomerates in the MacMillan Formation in the

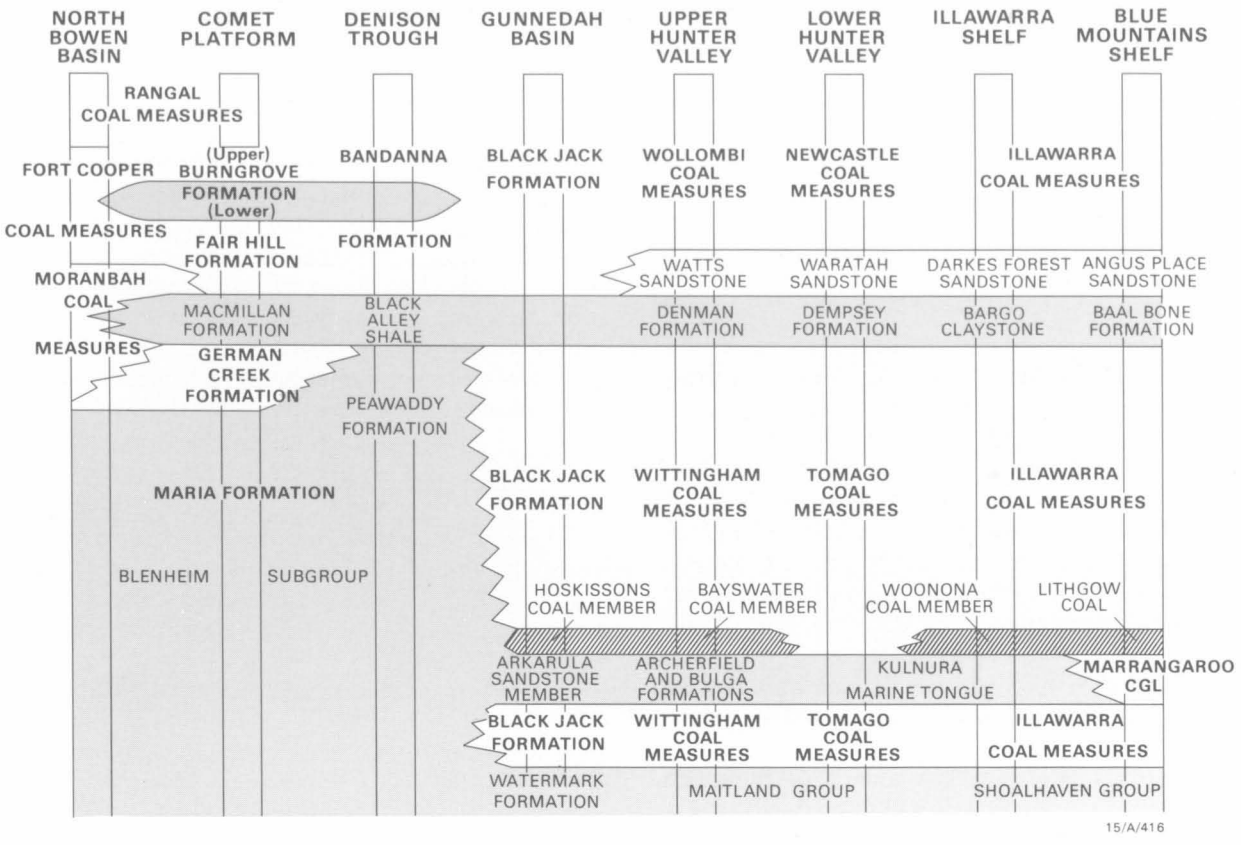

Fig. 17–4. Correlation accepted in this report between the Sydney, Gunnedah and Bowen Basins, equating the Dempsey and MacMillan incursions. Major marine units are stippled, minor local marine incursions are not shown.

Bowen Basin, but the Black Alley Shale and MacMillan Formation do contain some tuff, though not as much as in the overlying formations.

The longer persistence of marine conditions in the Bowen Basin suggests that a possible check on the model would be the examination of macrofaunal assemblages from the MacMillan Formation and the top of the Maria and Peawaddy Formations to see if they show any indication of being younger than assemblages at the top of the Maitland Group or in the Kulnura Marine Tongue (no shelly fossils are known from the Dempsey Formation or its equivalents in the Sydney–Gunnedah region). An investigation of the fossil assemblages by Dickins (1983) found that the upper Blenheim Subgroup, including the MacMillan Formation and Black Alley Shale, contains Fauna IV fossils, but that they belong to a distinctive faunal subdivision at the top of Fauna IV, termed the *M. havilensis* zone, which is not known from the Sydney Basin. The implication is that the top of Fauna IV could well be younger in the Bowen Basin than in the Sydney Basin, consistent with the favoured correlation model (Fig. 17–4). Runnegar (1967) has also suggested that the upper part of Fauna IV may be younger in the Bowen Basin.

Concluding Discussion

The structure contour and isopach maps (Plates 4 to 12) are based on the three-fold grouping into basal, middle, and upper coal measures.

The identification of marine incursions in the upper coal measures of the Sydney, Gunnedah, and Bowen Basins has enabled these sequences to be correlated over a distance of 1400 km in more detail than previously. In particular, the Dempsey, Denman, and Baal Bone Formations, and the Bargo Claystone (Sydney Basin), an unnamed marine to brackish unit below the Goran Conglomerate Member of the Black Jack Formation (Gunnedah Basin), and the Black Alley Shale and MacMillan Formation (Bowen Basin) can be seen as recording the same global highstand in sea level. Late Permian coal measure deposition began later in the Bowen Basin than in the Sydney and Gunnedah Basins, so that the German Creek Formation is equivalent only to part of the upper Tomago

Coal Measures. The limited palaeontological and palynological data available are consistent with these observations.

The Kulnura Marine Tongue and Marrangaroo Conglomerate of the Sydney Basin are, by contrast, the result of tectonic subsidence of the eastern half of the basin, so that the Kulnura incursion cannot be used for correlation outside the affected Sydney–Gunnedah region. It is equivalent to a level in the Peawaddy Formation in the Bowen Basin. The marine to brackish incursion of the lower portion of the Burngrove Formation, confined to the Bowen Basin in Newcastle Coal Measures time, also appears to have a tectonic cause.

Eustatic changes in sea level can therefore be used to correlate between widely separated areas. Although the method has previously been used for sequences in geological periods for which global sea-level curves have been published, this study has shown that it may also be applied to older sequences for which no published curves are available, if eustatic highstands (or lowstands) can be recognised. Thick terrestrial sequences, which are usually difficult to date precisely by normal correlation methods, are especially suitable for this technique if they contain marine intercalations that are demonstrably not the result of tectonically induced subsidence.

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CHAPTER 18

Synopsis of Geological Evolution of the Permian Coal Basins

by
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Introduction

Tectonically, there are three groups of Permian coal basins in eastern Australia: (1) *small rifts and valleys*, with coal seams up to 30 m thick; (2) *large interior intracratonic basins*, with histories comparable to those of the North Sea and West Siberia Basins, viz. the Cooper and Galilee Basins, which formed on a Palaeozoic orogen, and were filled by non-marine sediments and coals and then covered by the Mesozoic Great Artesian Basin; and (3) *marginal basins*, so called because they formed near the Permian coast of Australia. In the last group, the Sydney–Bowen Basin, which contains all the major black coal mines, was 1750 km long, subparallel to the present east coast, and initially was separated from the palaeo-Pacific Ocean only by a ridge in the developing Palaeozoic and Mesozoic New England–Yarrol Orogen. The basin is thought to have been a foredeep to the orogen, and may also have been a transform basin formed over a strike-slip fault system at the western edge of the orogen.

The interior and marginal basins each contain basal, middle and upper sequences of coal measures, these being separated in the interior basins by lacustrine shales, and in the marginal basins by marine sediments. Four of the five main coal basins began their development at the same time, near the start of the Permian period. The exception was the Galilee Basin, which received its first sediments in the Late Carboniferous. The Palaeozoic ice sheet was at its maximum in the earliest Permian, extending from Antarctica into the southern quarter of Australia. Periglacial conditions occurred farther north, but as the ice waned, were succeeded by cold-temperate conditions in which coal measures were laid down. Coal measures deposition was not initiated everywhere simultaneously. In the Cooper, Galilee, and Bowen Basins, the first major coals were emplaced at various times during the early Permian, whereas in the Gunnedah and Sydney Basins, the first major coals are younger and of mid-Permian age.

The start of deposition of the highly productive Late Permian coals was again asynchronous, this time beginning first in the Sydney Basin. In the marginal basins, the coal measures were deposited in prograding environments ranging from alluvial fan through fluvial to deltaic, but subject to marine incursions (one eustatic), and some deformation. They also received a lot of volcanogenic sediments from major igneous activity in the orogen. Towards the close of the Permian, a remarkable situation had developed in which coal measures were accumulating not only in all the major basins, but also in most of the minor basins, spread over a vast area extending for 3500 km from Cape York Peninsula to Tasmania. Even more remarkably, coal formation appears to have stopped everywhere in this region at the same time, just before the close of the Permian, when the coal-producing environments were blanketed by thick fluvial deposits. The orogenic movements responsible for this, as well for as for the several Mesozoic and Tertiary episodes of folding, faulting, and igneous activity, determined the depths of burial of the coal measures and the temperatures to which they were subjected, and it could have been expected that some of them would have affected the rank of the coals. However, the eastward increase in coal rank is surprisingly regular, which indicates that it was established by the Early to Mid Triassic and was not greatly affected by subsequent changes in geothermal gradients or by the depression and filling of the Surat and Eromanga Basins.

Synopsis of the Evolution of the Sydney Basin

Initial environment and palaeogeography

At the beginning of the Permian period, the Sydney Basin did not exist as a structural entity. To the north, the Late Carboniferous Seaham Formation had been deposited in northeasterly draining fluvial and lacustrine environments, in a cold climate in which ice-rafting and possibly valley glaciation existed (Brakel, 1972). In the south, the Talaterang Group was being laid down by easterly flowing streams, in deeply incised valleys which had probably been cut by valley glaciers (Herbert, 1972). Elsewhere along the present western basin margin, an erosional regime prevailed on a land composed of older Palaeozoic rocks. Disconformity or low-angle unconformity between the Late Carboniferous sediments and the overlying Permian has been observed in many places, and may be the case everywhere in the Sydney Basin (see Chapter 3). This is attributed to tectonic movements, which allowed the Early Permian sea to transgress over the area of the present Sydney Basin, and the eastern half of the New England Fold Belt, with some of the western part of the fold belt being emergent as the Campbell High (Korsch & Harrington, 1981, p. 222). The tectonism was associated with the formation of volcanic rifts with bimodal volcanics, which extended from west of Sydney, and northwards through the Macdonald Trough and Gunnedah Basin. In the Bowen Basin, the Early Permian volcanics seem to form a calcalkaline volcanic arc, which suggests a northwards change in tectonic setting during that time. The change

has been recognised, but has not been studied by the writers.

The climate at the beginning of the period was cold, and floating ice rafted debris into the Early Permian marine embayment.

Later environments and palaeogeography

The main structural elements of the basin appear to have been present from its inception, when the north–south volcanic rift formed along the Lapstone basement fault (Harrington & Brakel, 1981). The western side of the rift became the Lapstone hinge line, which has been intermittently active during the Permian, and since. It separates the Blue Mountains–Illawarra Shelf from the Macdonald Trough, the latter occupying the site of the major underlying rift. The eastern side of the rift came to define the western margin of the Lochinvar–Kulnura Ridge (Chapter 28) and it was possibly also a fault, part of which is now under Prospect Reservoir. The meridional structural anisotropy thus established was probably present also east of the Lochinvar–Kulnura Ridge, where structures active during the Late Permian follow similar trends.

Along the northern basin rim, uplift of the hinterland in Greta Coal Measures time caused an alluvial fan wedge of coarse clastics and coal seams to prograde to the south, interrupting marine conditions in the Lower Hunter area, and covering weathered Permian volcanics to the northwest and in the Gunnedah Basin. Coalification studies and the direction of splitting of coal seams show that there was also relative movement between the Muswellbrook and Lochinvar Anticlines and the intervening Bayswater Syncline. The Cranky Corner Basin at the time lay northeast of its present location, by a distance equal to the amount of overthrusting on the Hunter Thrust System.

Subsequently rising sea level not only ended Greta Coal Measure deposition in the north of the basin, but also resulted in transgression along the western margin. A return of cold climate saw valley glaciers form along the western basin rim and discharge ice into the adjacent sea.

Renewed tectonism at the start of the Late Permian at first caused an hiatus in the marine sequence. Continuing uplift and volcanism in the New England region, and rapid subsidence in the neighbouring Sydney Basin, then stimulated vigorous erosion and transport of sediment southwestwards across the axis of the basin, with only minor amounts of sediment being introduced at times from the more stable Lachlan Fold Belt to the southwest (Herbert, 1980). The sedimentary wedge that was deposited (the upper coal measures) consequently displays a long-term progradational trend, with a succession of facies progressing from prodelta to lower delta plain, upper delta plain, and fluvial. The general trend was, however, punctuated by marine incursions, the effect of which on sedimentation was to produce temporary reversals of the long-term trend, and short-lived repetitions of earlier, more distal environments.

The lower part of the prograding wedge, comprising the Tomago Coal Measures and equivalents, was laid down predominantly in a deltaic environment, but along the western basin margin, alluvial fan and braided fluvial facies were also important. Initially, sediments were thickest in the centre and south of the basin, but the depocentre moved northwards to the Broken Bay area near Gosford after the tectonically induced marine incursion (Chapter 17) of the Kulnura Marine Tongue. Both the Lake Macquarie and Macdonald Troughs were actively subsiding, while the adjacent Lochinvar–Kulnura Ridge and Blue Mountain–Illawarra Shelf formed relative highs on which thinner sequences accumulated. Uplift on the Lochinvar Anticline early in the interval resulted in local erosion and unconformity. There was also pronounced subsidence on the northern side of a probable fault between Broke and Jerrys Plains, which Stuntz (1972) considered was active just before the Kulnura marine episode. It is conceivable that the upper Hunter region formed a block, bounded by the Broke and Mt Ogilvie faults, which tilted to the south so that the thickest coal measure sequence was deposited along its southern side. Subsidence of the block would explain the observed coal rank differences across the Mt Ogilvie Fault. The Muswellbrook Anticline seems not to have been uplifted again until after the marine event.

The Kulnura Marine Tongue itself resulted from the eastern half of the basin subsiding along the reactivated lapstone basement fault, probably as an expression of the same tectonic movement that initiated the "Broke Fault". Another marine intercalation, ending the Tomago episode, had a eustatic cause.

The main depocentre had shifted northwards in Newcastle Coal Measures time to the Lake Macquarie area, but subsidiary depocentres existed in the Cumberland Sub-basin, the Macdonald Trough, and the northern side of the "Broke Fault". The Newcastle interval saw a continuation of the long-term progradational trend that was interrupted by the marine incursion at the end of Tomago deposition. The new cycle of progradation started with the littoral and coastal dune sands of the Waratah Sandstone and equivalents, passed through a progression from lower delta to upper delta plain facies, and gave way to fluvial sedimentation, which in the north culminated in proximal alluvial fan wedges, derived from the rising New England Orogen, and from the northern end of the Northumberland Ridge. The latter was the site of much volcanic activity. Thick volcanic ash falls may have affected sedimentation patterns in places. At the close of coal measure deposition,

there is some evidence of renewed estuarine influence, followed by fluvial erosion of the coal measures in the north, west, and south. On the southern Lochinvar Anticline, uplift tilted the coal measures so that they came to lie unconformably below the Triassic, and locally the entire upper coal measures succession was eroded away. During the Triassic, the rate of subsidence appears to have slowed, at least in the Macquarie Syncline.

The final form of the basin architecture, as it exists at the present day, was determined to a large extent by the Mid Triassic "Hunter–Bowen Orogeny" which caused further folding in the Hunter Valley Dome Belt, overriding of the northern margin along the Hunter Thrust, uplifting of the Blue Mountains Plateau along the reactivated Lapstone basement fault, and the formation of the Woronora Ridge by faulting and possible upwarp. The Cretaceous break-up of the continental margin leading to the rifting away of an eastern terrane, now the Lord Howe Rise, left its mark, especially in producing a high geothermal gradient during the rift phase (see Chapters 25 to 28 for detailed discussions). Following the break-up there were Cainozoic adjustments that had major effects on the topography.

The end results of the basin history are that the upper coal measures crop out or occur at minable depths in the Lake Macquarie Trough, the Hunter and Goulburn valleys, the Blue Mountains–Illawarra Shelf, and the Woronora Ridge, while the Greta Coal Measures are accessible in the Lochinvar Anticline, Muswellbrook Anticline, Cranky Corner Basin, and Sedgefield–Belford areas (see Chapter 3).

Synopsis of the Evolution of the Bowen Basin

At the beginning of the Permian, extensive volcanism built up a thick pile of lavas and associated rocks east of the Collinsville–Comet High. Some coal measures and marine sediment lenses were interbedded. Meanwhile, to the west, the Denison Trough formed, possibly as a pull-apart basin in a braided strike-slip fault zone, and began accumulating a thick sequence of coal measures which eventually filled the trough by the end of Reids Dome beds time. The sedimentary environments included alluvial fans, braided and meandering streams, lakes, deltas, and back-barrier swamps. Equivalent fluvial sediments were laid down in the Arbroath Trough, and in the southern end of the Taroom Trough below the Surat Basin. There was some further subsidence in the Denison Trough later in the Permian, but it was small by comparison; the post-Reids Dome units tend to have blanket-like geometries, and their enclosed marine sandstones are always shallow-water deposits, as evidenced by *Skolithos* burrows and beach or marine bar sediments in the Freitag Formation, the Catherine Sandstone (Brakel, 1983), and the top of the Peawaddy Formation. The later subsidence was greater in the Springsure–Rolleston area than farther south.

After the Cattle Creek–Tiverton marine transgression, the Aldebaran Sandstone delta grew in the Denison Trough from a westerly source, first filling the low areas of the trough and then spreading over the sides. Only minor coals were preserved. In the north, however, economic coals accumulated near Collinsville, in an alluvial fan–fan delta wedge sourced mainly from the west. Along the western basin margin, near Rugby, similar coal measures, thinning basinward, were laid down. Important and very thick coals also formed at this time in bogs in the Blair Athol and Wolfang Basins. The coal measures in the west contrast with marine deposits in the Taroom Trough, where there was greater subsidence than elsewhere throughout most of the Permian. Unconformities between the Aldebaran and Freitag Formations (Power, 1966), and between the Buffel and Oxtrack Formations (Mollan & others, 1972), point to an important mid-Permian uplift which exposed the affected regions to erosion for a time, before marine conditions returned (see Chapters 7 and 28).

In the late Permian, the largely deltaic German Creek Formation heralded the resumption of coal measure deposition. Fluvial influence was greatest in the north. Interseam thickness variations, and vitrinite reflectance studies, show that the rate of subsidence was greatest towards the east (Beeston & others, 1979). The southern limit of the unit corresponds with the margins of the Comet Platform, implying that this feature was a structural high on which coal measures could accumulate while adjacent lower regions were too deep to be filled and thus remained marine.

Following the eustatic transgression of the MacMillan Formation, coal measure deposition was established basinwide. The locus of greatest coal accumulation moved east to the Taroom Trough, where subsidence allowed thicknesses of up to 900 m of coal-bearing beds to be preserved. Sedimentary facies ranged from fluvial in the north to deltaic with some back-barrier deposition elsewhere. The lower Burngrove Formation records a brackish marine incursion. Volcanism to the east, at times intense, was responsible for adding large volumes of tuff to the basin. Apart from minor activity, such as possible growth-faulting near Emerald, the only tectonism in the western half of the basin was a down-tilting hinged about the western margin. The Denison Trough and Collinsville–Comet High had therefore ceased to behave as separate structural elements.

During the early Triassic, substantial subsidence continued in the Taroom Trough. In the mid-Triassic, major tectonism caused thrusting from the east and folding in much of the Bowen Basin. These thrusts have adversely affected coal mining south of Blackwater. In the Denison Trough, the compression caused large-scale flexure folding and graben-marginal thrusting. The most intense deformation was felt in the Dawson and Gogango Folded Zones, where faults and isoclinal folds proliferated. The activity in these zones extended southwards as the Burunga and Gooniwindi fault systems. Early Tertiary tensional forces produced the Duaringa Basin graben.

Synopsis of the Evolution of the Galilee Basin

The major structural features of the Galilee Basin were initiated at an early stage in its development; and during the Late Carboniferous–Early Permian, the Koburra Trough and possibly the Lovelle Depression, Barcaldine Ridge, Powell Depression, Springsure shelf, and other smaller structures were clearly evident.

Later in the Early Permian, the Koburra Trough was less well defined. This trough received up to 3 km of Late Carboniferous, Permian and Triassic sediments; the thickest sedimentary sequence is in the deepest part of the basin. The deepest structural level of the top of the Joe Joe Group is –1750 m in the Powell Depression.

Following the cold-climate fluvio-lacustrine deposition of the underlying formations of the Joe Joe Group, the Early Permian Aramac Coal Measures originated as the product of a swamp-dominated, possibly meandering, fluvial system. Mid-Permian uplift halted sedimentation, and erosion proceeded to truncate the coal measures and even remove them in places (see Chapters 10 and 28).

There is no record of further deposition until the Late Permian, when a peat swamp and fluvial environment was established once again, and the Colinlea Sandstone prograded across the basin. This interval shows little evidence of structural change since earlier times. During the Late Permian, a marine transgression inundated the Springsure Shelf, where a marine mud sequence came to overlie Colinlea Sandstone and Joe Joe Group and, locally, basement crystalline rocks.

The youngest of the Permian units, the coal-bearing Bandanna Formation, was deposited across most of the basin as a blanket, usually 30–200 m thick. This may include some lateral facies equivalents of the Colinlea Sandstone. The greatest thickness, along the eastern basin margin, was largely derived from the Anakie Inlier–Drummond Basin high to the east. Thick sequences in the Lovelle Depression and Marchmont Syncline, and moderately thick sequences in the Powell Depression, were also probably derived from neighbouring basement uplifts. Areas of thin sedimentation around the Barcaldine Ridge testify to its strong influence on deposition.

In the Triassic, the Koburra Trough and Springsure Shelf were still subsiding more rapidly than the Lovelle and Powell Depressions. The thickest Triassic sediments accumulated both toward the basin's eastern margin and on the Springsure Shelf, following rejuvenation and uplift of the Anakie Inlier early in the period.

Triassic rocks are absent from the Hulton Rand region in the central basin and from part of the area between the Powell Depression and Springsure Shelf. These places may have been near the depositional edge, although it is just as likely that uplift and removal of some or all of the sequence occurred prior to covering by the Jurassic–Cretaceous Eromanga Basin sequence. The Powell and Lovelle Depressions were both sites of major subsidence during the late Mesozoic, with up to 1800 m of sediments being preserved; by contrast, in the Koburra Trough, subsidence had virtually ceased by the end of the mid-Triassic.

Synopsis of the Evolution of the Cooper Basin

The principal coal-forming epochs in the Permian Gidgealpa Group were during deposition of the Patchawarra Formation (basal coal measures — Early Permian) and Toolachee Formation (upper coal measures — Late Permian), with lesser coal formation in the middle coal measures, Epsilon and Daralingie Formations. Up to 1600 m of Gidgealpa Group accumulated in the south, but the equivalent sequence is much thinner in the north.

The Cooper Basin experienced subsidence and structural growth during most of the Permian Period. Several structurally high areas in the Basin, including those at Packsaddle, Merrimelia, and Murteree, are devoid of Permian sediments. In addition, the Daralingie, Murteree and Tickalara Structural Highs, and possibly the Innamincka High, are devoid of Patchawarra Formation, although this formation has been identified in the Arrabury area in the northern Cooper Basin. The remainder of the northern Cooper Basin contains undivided Gidgealpa Group. The absence of the Patchawarra Formation over the culminations of

several structures on the Gidgealpa–Merrimelia/Nappacoongie–Murteree and Tickalara Trends (Merrimelia, Packsaddle, Innamincka/Daralingie/Murteree/Tickalara) is indicative of structural uplift during the Early Permian, and stripping of the formation over the crests as a result of mid-Permian erosion (Chapters 11 and 28).

Similar structural growth took place during the Late Permian, when most of the bald-headed structural highs were still being eroded. Differential movements are indicated by the relative distributions of the Toolachee and Patchawarra Formations over the culminations of the mid-basin highs.

The postulated depositional environments in the Gidgealpa Group include rivers, lakes, coal swamps and large inland 'seas' during a period when the geomorphic relief diminished with time. Initially the environment was fluvial with deposition mainly from braided streams, and showed a gradual transformation to meandering streams on a floodplain. Coal measure deposition was lake marginal to fluvial. Semi-diagrammatic palaeogeographic maps for the whole Permian by Thornton (1969) delineate areas dominated by lakes and swamps, interdistributary bays, lower coastal plains (coal poor), upper coastal plains (coal rich), delta plains, and delta fronts. The middle coal measures were emplaced in deltas building into large bodies of water which have been interpreted as either freshwater lakes or as restricted brackish arms of the sea.

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CHAPTER 19

Coal-Type Trends in the Permian Basins

by
J.W. Hunt

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Introduction

Coal type corresponds to variation in the organic constituents, which reflects both the composition of the original peat-forming flora and depositional environment. Coal type may be determined by either macroscopic or microscopic criteria. Macroscopic description of Permian coals in terms of the bright (vitrinite-rich) and dull (vitrinite-poor) components is routinely undertaken in Australia. It is possible to predict confidently the microscopic constituents of coals from macroscopic features once a correlation between the two has been established. However, finely disseminated mineral matter can change the appearance of coal, making correlation unreliable particularly where few data are available. The application of macroscopy to characterise the Permian coals was investigated during this study. However, since several "dull" coals are vitrinite rich and many economic vitrinite-rich coals graded laterally into vitrinite-rich "dull" coals, the use of macroscopic characterisation of coal type would be unreliable. Coal type is therefore described here in terms of microscopic maceral and microlithotype analyses. This type of information is held largely in the CSIRO's data-base, but also includes published information by the Joint Coal Board and Geological Survey of Queensland. Selected petrographic information for the Permian basins is shown in CSIRO data-base, accompanying this publication. Samples from the Geological Survey of Queensland have been reanalysed at CSIRO to generate an internally consistent set of maceral and microlithotype data for both the Sydney and Bowen Basins. Additional samples from recent drilling programs in the Sydney and Gunnedah Basins by the New South Wales Department of Mineral Resources and several companies have also been examined to supplement information in poorly known areas.

In the following chapter, microscopic coal type is reviewed systematically by age and basin (see Fig. 19–1 for locations). The division of basins into intracratonic and marginal types offers a convenient framework to explain petrographic variation.

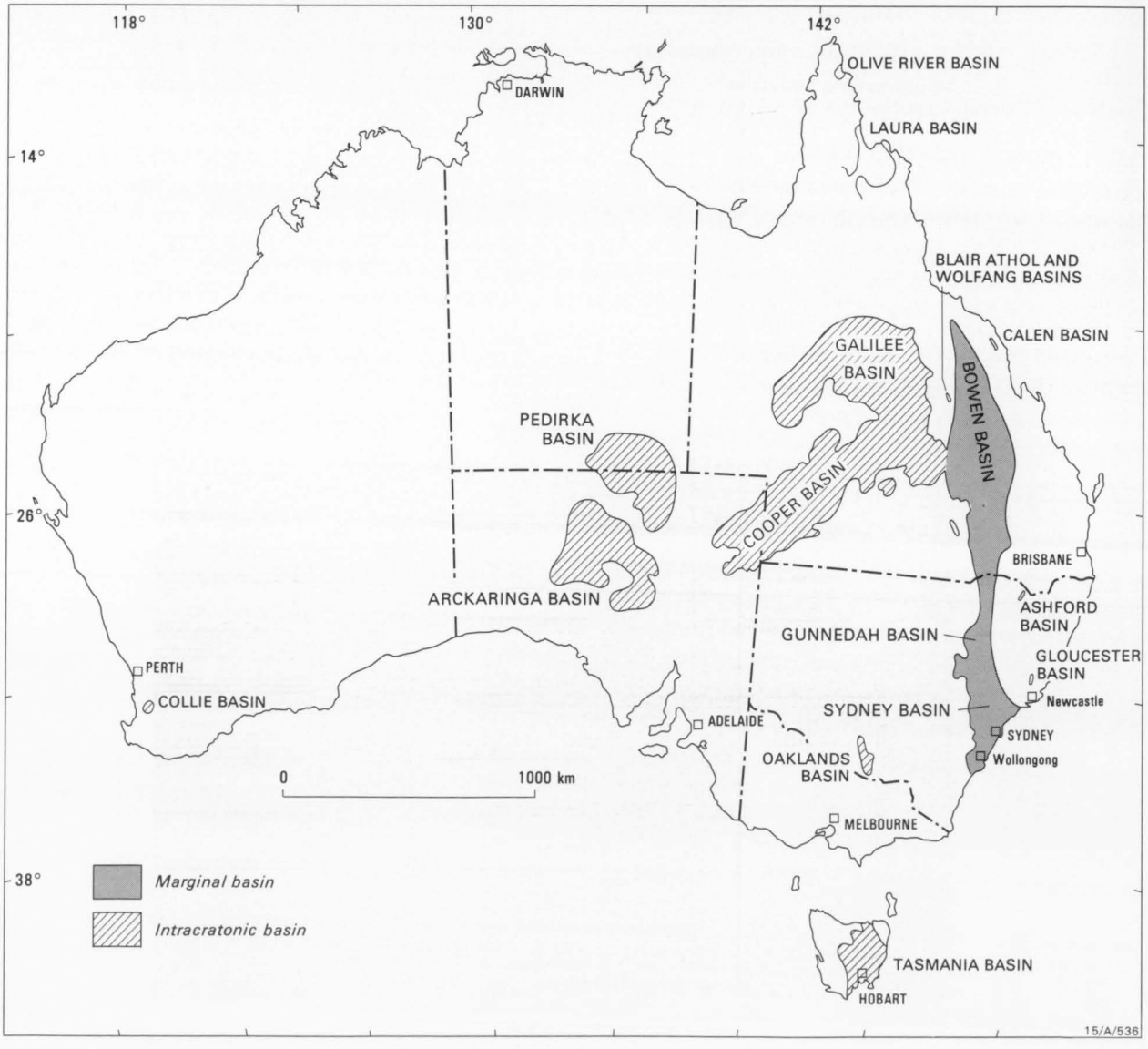


Fig. 19–1. Location of the Permian coal basins.

Coal Type

Coal type is discussed in terms of both microscopic maceral and microlithotype compositons. The petrographic analyses are reported on a mineral matter-free basis (mmf) because there is no simple relationship between the genesis and distribution of mineral matter, on one hand, and the associated organic components, on the other.

Most of the petrographic analyses made at CSIRO are for clean coal composites, i.e., excluding subsections with > 35% ash by weight. Recently, with interest in washability of coals, analyses have been made on 1.60 relative density float fractions. Indications are that for the Permian coals the difference in maceral composition between the 1.60 float fraction and clean coal composites is not significant.

Maceral analysis

Maceral analysis determines the proportion by volume of organically derived, microscopically recognisable components of coal, which are defined by their morphology and colour. At the simplest level, the macerals are divided into three main groups — vitrinite, inertinite and exinite. Vitrinite (Fig. 19–2) originates mainly from humified "woody" plant remains. Inertinite, representing oxidised and degraded plant remains, can have the same origin as vitrinite, and is divided principally into semifusinite (Fig. 19–2), with botanical structure (cell lumens), and inertodetrinite (Fig. 19–2) which is broken and detrital inertinite without botanical features. Micrinite comprising secondary or very fine detrital inertinite (< 2μm) and macrinite, consisting of very large (<30μm) rounded inertinite particles, generally are only 1 or 2% of Australian Permian coals.

In this chapter, maceral data, from routine analyses by CSIRO and other laboratories, are presented using the following groupings (Fig. 19–3a): (a) vitrinite + exinite, (b) semifusinite + fusinite, and (c) other inertinite macerals (mainly inertodetrinite).

Microlithotype analysis

Individual microlithotypes are defined by maceral assemblages, and their compositions for Australian Permian coals are presented herein using the following groupings:

(a) "vitrite + clarite"–50μm bands composed mainly of vitrinite (>95%) or vitrinite + exinite (both >5%);
(b) "inertite + durite"–50μm bands of inertinite (>95%) or inertinite + exinite (both >5%); and
(c) "vitrinertite + duroclarite + clarodurite"–50μm bands of vitrinite + inertinite + exinite (all >5%), determined by the "selon-la-ligne" method (ICCP, 1963).

As Australian Permian coals are generally low in exinite (<5%), microlithotype analyses, when presented as described above, in fact approximate a two-component system, with vitrite (>95% vitrinite) and inertite (>95% inertinite) as end-members. The degree of mixing (measured microscopically at the 50μm level) of the two components varies in

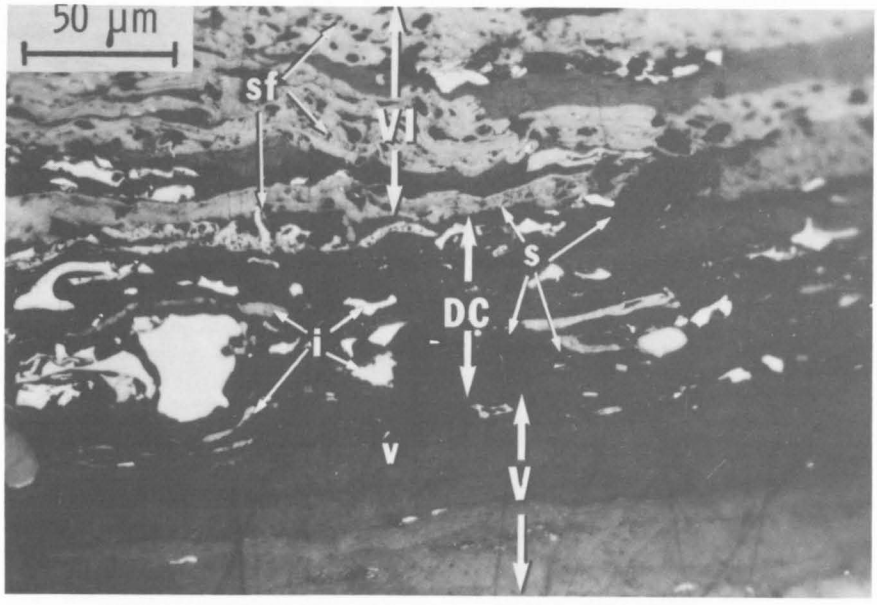


Fig. 19–2. Macerals and microlithotypes in a coal from the Late Permian Newcastle Coal Measures of the Sydney Basin.

coals of different ages and locations. In Fig. 19–3b it is shown as being coarse, medium, finely and very finely banded, using banding coefficients defined by curves of height (h) 1–9, each enclosing 10% of the area of the diagram. The curves were derived from data of this study (Cameron & Hunt, 1985) and Bennett (1974) observed similar trends in macroscopic coal lithotypes data in terms of bright and dull components at a 5 mm minimum band width. The approximate vitrinite content of a coal can be calculated from a microlithotype analysis using the formula "vitrinite = vitrite + clarite + 0.5 (vitrinertite + duroclarite + clarodurite)" (Smyth, 1974). Microlithotype composition of Australian Permian coals has previously been discussed by Hunt (1982).

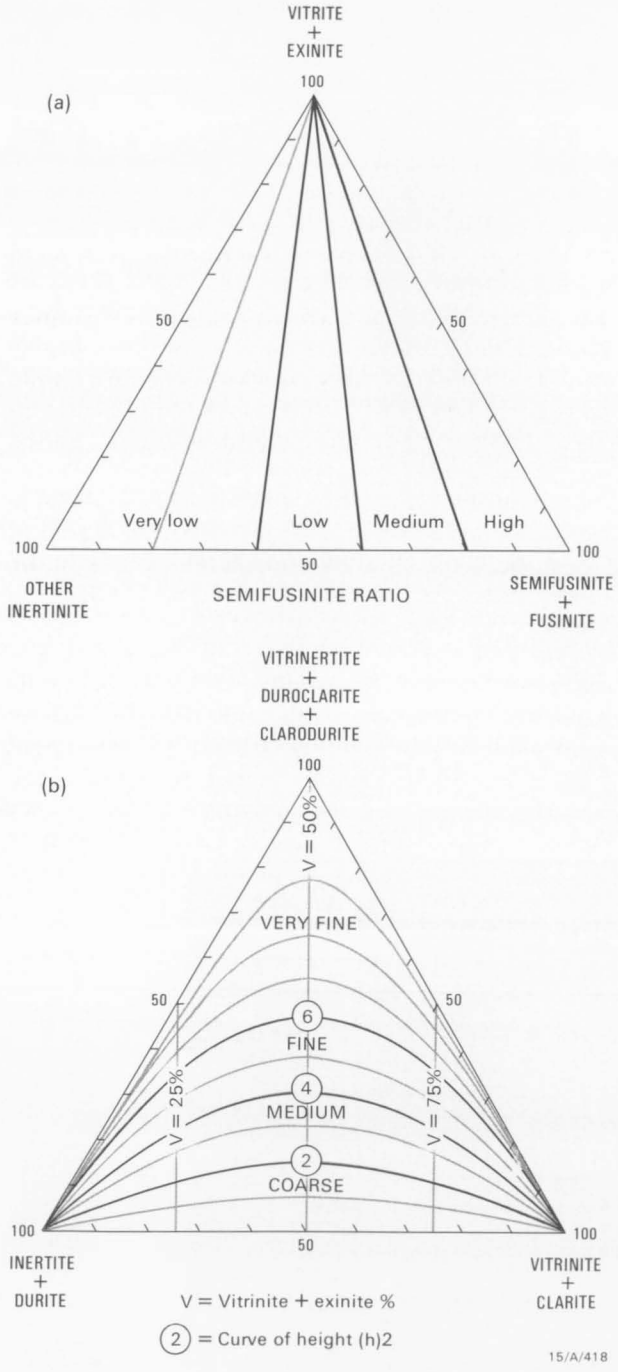


Fig. 19–3a. Maceral composition diagram showing the "semifusinite ratio".

Fig. 19–3b. Microlithotype composition diagram showing band width.

Coal Facies Analysis

Coal type is determined principally by the kind of flora of the precursor peat and the extent of its alteration by oxidation or biochemical agents during deposition and early diagenesis. Coal facies analysis has in the past been based mainly on microlithotypes (e.g., Hacquebard & others, 1967). More recently, several Australian researchers have independently investigated the application of macerals in coal facies analysis (Diessel, 1982; Beeston, 1982; Fleming, 1982).

In this chapter, coal facies analysis is discussed using the maceral grouping mentioned above. Coal facies diagrams have been constructed which show the ratio of (a) non-oxidised (vitrinite + exinite) to oxidised (inertinite) macerals, and (b) structured inertinite (semifusinite + fusinite) to detrital inertinite (inertodetrinite + micrinite + macrinite).

Vitrinite content of clean coal composites, or 1.60 relative density float fractions, is characterised as low (<40% mmf), medium (40–60% mmf) and high (>60% mmf) in the text and on the palaeogeographic maps discussed below.

The exinite group of macerals, present as accessories in most coal samples, are given a significant role in the microlithotype coal facies analysis scheme of Hacquebard & others (1967). However, because exinite is only a minor component of Australian Permian coals (about 5% in the Late Permian) and consists mainly of spores, no significance has been given here to exinite.

The ratio of structured to detrital inertinite is constant and characteristic of coals from different locations and is referred to as the "semifusinite ratio". The semifusinite ratio on Fig. 19–3b is described as high (1.0–0.8), medium (0.8–0.6), low (0.6–0.4), and very low (0.4–0.0). Semifusinite ratio ranges in text figures include 90% or more of samples analysed, with outlying values shown as points.

A significant proportion of "band macrinite" in coals of the Cooper Basin was formed from partly gelified woody material (telinite precursor) by oxidation, probably owing to fluctuating ground water levels. It has been added to the structured inertinite macerals in the Cooper Basin coal analyses.

Distribution of Coal Types in the Permian Basins

In the following section, the variation in maceral and microlithotype of the Permian coals is reviewed by age and basin. A simplified and condensed correlation table of the main coal-bearing units is presented in Table 19–1.

Early Permian

Marginal basins

Bowen Basin. This basin contains Early Permian coal measures at two horizons: the lower sequence in the Reids Dome beds was deposited early in the Early Permian, and the upper sequence, which includes the Collinsville Coal Measures and equivalents in the Back Creek Group, was formed late in the Early Permian.

Few data are available on petrographic variation of coals in the Reids Dome beds. Seams in GSQ Taroom 11/11A and GSQ Emerald 1 include both low and high-vitrinite coals, which have a low to medium-semifusinite ratio (Fig. 19–4a). Exinite content ranges between 4 and 8% (mmf) and is composed mainly of sporinite (Fig. 19–4b). The Reids Dome beds coals are chiefly finely banded (Fig. 19–4c).

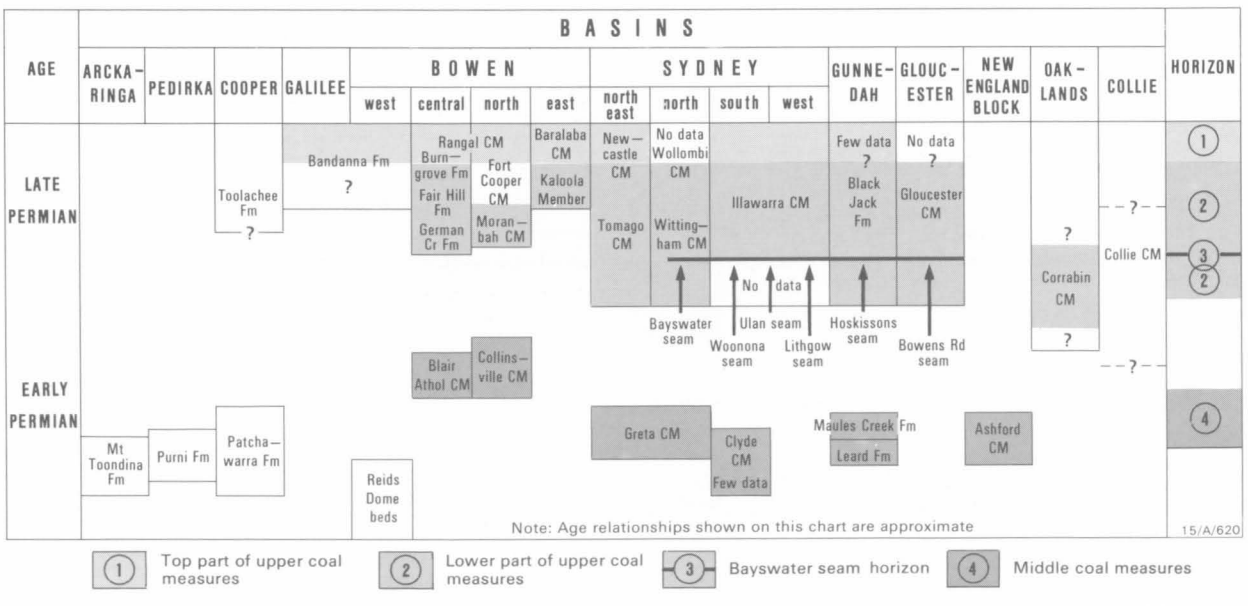
In the Collinsville Coal Measures, vitrinite content is lowest for the basal seam (20–30% mmf), but medium to high for the rest of the sequence. The semifusinite ratio is medium (Fig. 19–4a). Exinite of the basal seam ranges from 1 to 7% (mmf) and consists predominantly of sporinite. The coals are medium banded (Fig. 19–4c). Collinsville Coal Measures equivalents are present near Rugby to the south. A single 8 m-thick dull seam in the Rugby bore (Davis, 1970) has 37% vitrinite (mmf).

Gunnedah Basin. Limited petrographic data are available for Early Permian coals of the Leard and Maules Creek Formations in the Gunnedah Basin. Coals in the underlying Leard Formation, which is transitional with basement, are low in vitrinite. A single seam in a compressed sequence of the Leard and Maules Creek Formations in DMR Howes Hill DDH1 in the southwest of the basin has 28% (mmf) of mainly resin-impregnated vitrinite and a low semifusinite ratio (Hunt & Telfer, 1983a). High-vitrinite seams are present within the thick sequence in the northeast of the Gunnedah Basin (Hunt & Telfer 1983b). The semifusinite ratio of coals in the northeastern sequence is low to medium (Fig. 19–5a), which is atypical by comparison with most Early Permian coals in the Sydney Basin. Exinite ranges between 4 and 12% (mmf) and is composed chiefly of sporinite and resinite (Fig. 19–5b). Coals in the Maules Creek Formation in the northeast contain medium to finely banded microlithotypes (Fig. 19–5c).

Sydney Basin. Petrographic data are available for the Early Permian Greta Coal Measures at Cessnock, Muswellbrook and Glendonbrook in the north of the Sydney Basin and the Clyde Coal Measures in the south.

The Greta Coal Measures at Cessnock are characteristically high in vitrinite, which generally increases up the sequence, and the semifusinite ratio is low to medium (Fig. 19–5a). Exinite ranges from 8 to 12% (mmf) and consist mainly of sporinite (Fig. 19–5b). In the outlying Cranky Corner Basin north of Cessnock, the Tangorin seam in

TABLE 19–1. SIMPLIFIED CORRELATION CHART FOR THE PERMIAN COAL BASINS, SHOWING HORIZONS USED FOR PALAEOGEOGRAPHIC RECONSTRUCTIONS



high in vitrinite, has a low semifusinite ratio (Fig. 19–5a), and has 9% (mmf) exinite. The Greta Coal Measures at Cessnock and Glendonbrook show finely to very finely banded microlithotypes (Fig. 19–5c). In the Greta Coal Measures at Muswellbrook, vitrinite content increases up the sequence and a low-vitrinite basal seam is sometimes present. The semifusinite ratio is mainly low (Fig. 19–5a). Exinite ranges from 7 to 13% (mmf) and consists of sporinite with some resinite (Fig. 19–5b). The microlithotypes at Muswellbrook are finely to very finely banded (Fig. 19–5c).

A single seam in the Clyde Coal Measures from the south of the Sydney Basin (Cook & Read, 1968) has about 58% (mmf) vitrinite, and the semifusinite ratio is low (Fig. 19–5a). Exinite content is 7% (mmf) and the coal is the most finely banded in the marginal basins (Fig. 19–5b).

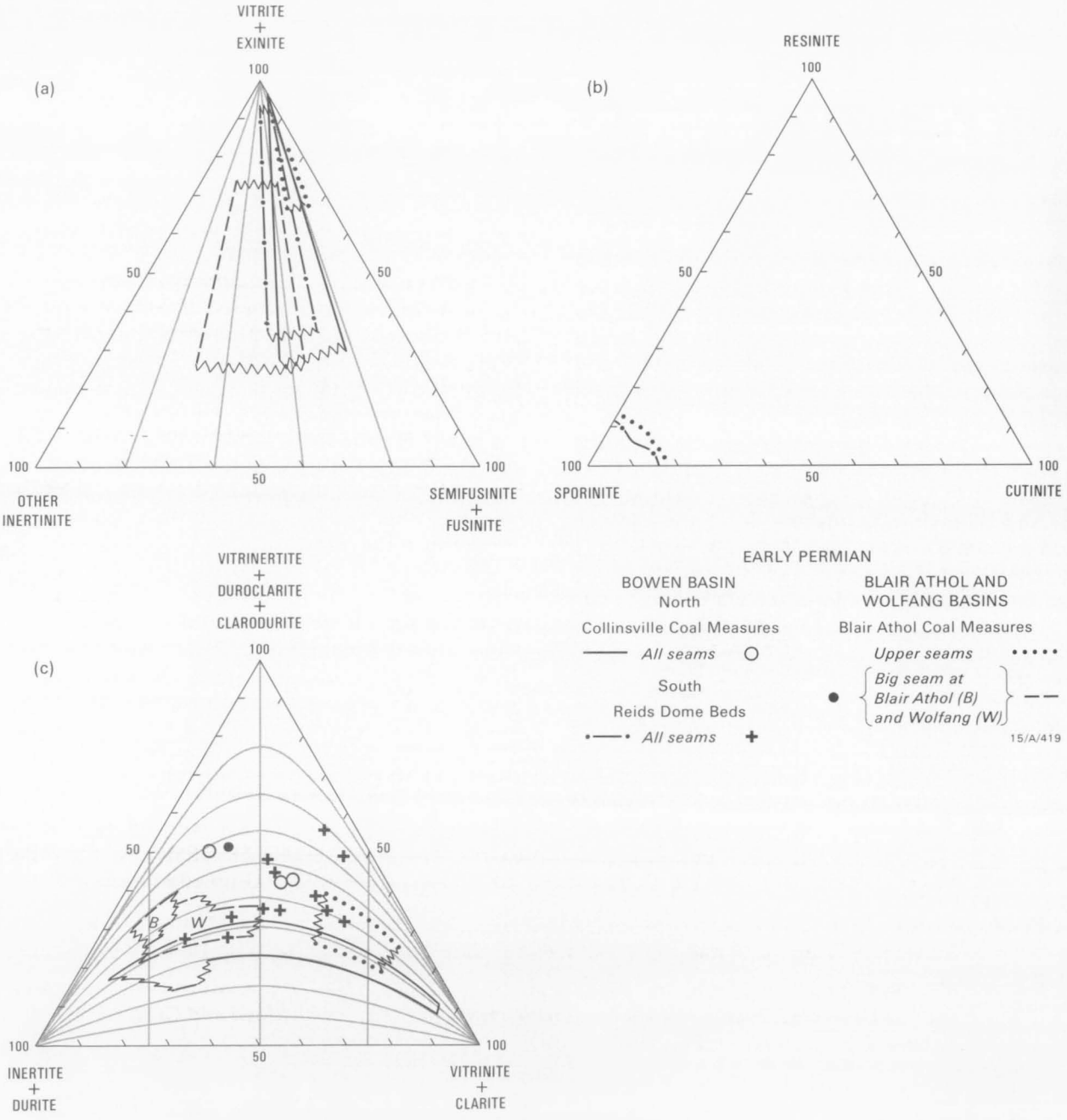


Fig. 19–4a. Maceral composition (mmf) of seams in the Collinsville and Blair Athol Coal Measures from the Bowen Basin.

Fig. 19–4b. Composition of exinite from seams in the Collinsville and Blair Athol Coal Measures from the Bowen Basin. For symbols, see Fig. 19–4a.

Fig. 19–4c. Microlithotype composition (mmf) of seams in the Collinsville and Blair Athol Coal Measures from the Bowen Basin. For symbols, see Fig. 19–4b.

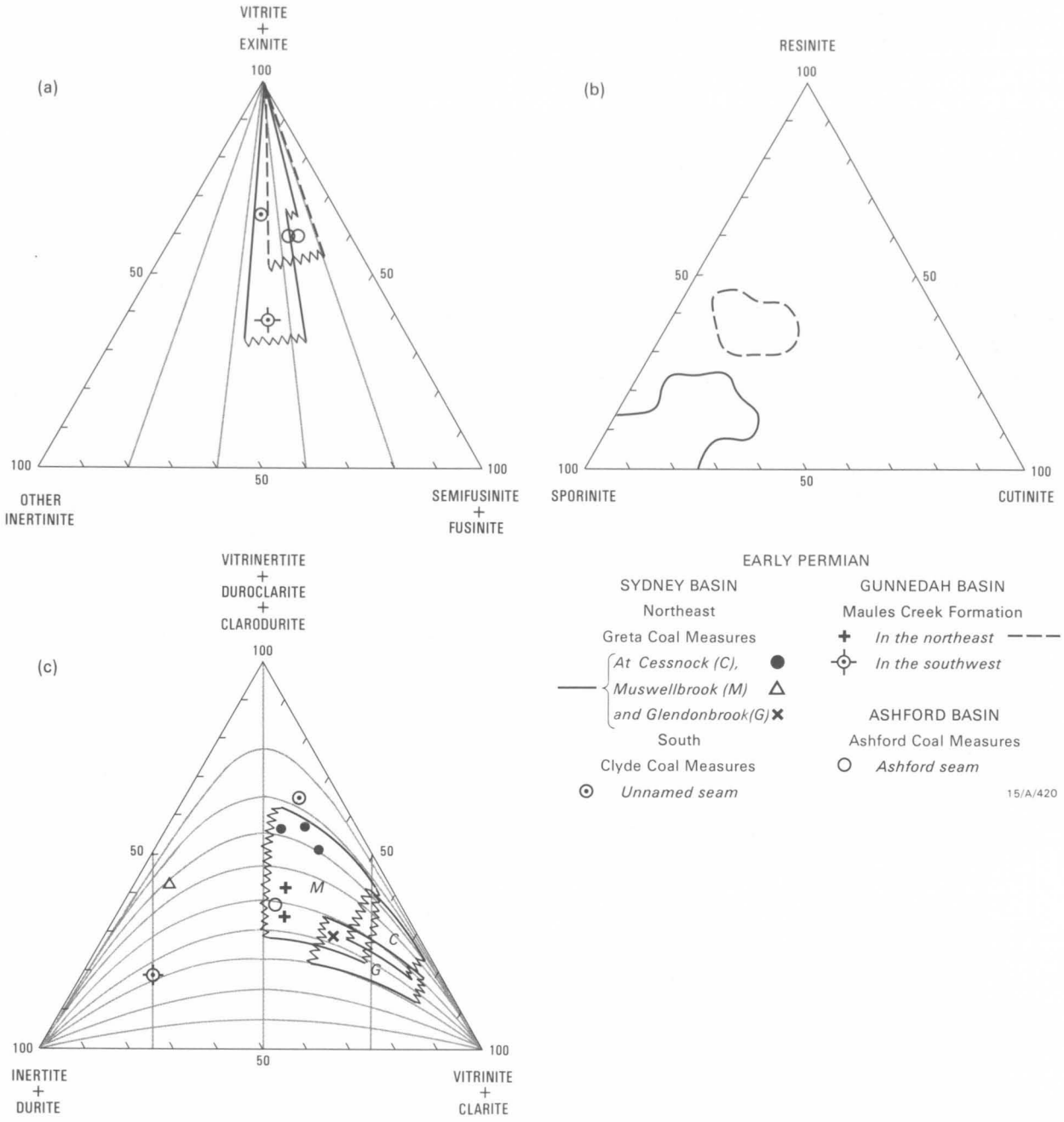


Fig. 19–5a. Maceral composition (mmf) of seams in the Greta, Clyde and Ashford Coal Measures and the Leard and Maules Creek Formations from the Sydney, Ashford and Gunnedah Basins.

Fig. 19–5b. Composition of exinite from seams in the Greta Coal Measures and the Maules Creek Formation from the Sydney and Gunnedah Basins. For symbols, see Fig. 19–5a.

Fig. 19–5c. Microlithotype composition (mmf) of seams in the Greta, Clyde and Ashford Coal Measures and the Leard and Maules Creek Formations from the Sydney, Ashford and Gunnedah Basins. For symbols, see Fig. 19–5a.

Intracratonic basins

Blair Athol and Wolfang Basins. West and south of the Rugby area, low-vitrinite coals are found in the Blair Athol Coal Measures at Blair Athol and Wolfang. The Big seam (about 30 m thick) at Blair Athol is low in vitrinite, has a low semifusinite ratio (Fig. 19–4a), and has up to 4% (mmf) exinite, with sporinite dominant. A 30 m-thick seam in the adjacent Wolfang Basin is also low in vitrinite, has a low to very low-semifusinite ratio (Fig. 19–4a), and 4–8% (mmf) exinite, which is composed mainly of sporinite (Fig. 19–4b). Underlying thin seams are low to medium in vitrinite, with a low semifusinite ratio. The upper section of the thick seam at Wolfang and the overlying thin seams have high vitrinite contents with a low to

medium semifusinite ratio (Fig. 19–4a) and have 2–6% (mmf) exinite, also mainly sporinite. The Blair Athol Coal Measures are mainly finely banded (Fig. 19–4c).

Ashford Basin. The Early Permian Ashford Coal Measures are located within the orogenic New England Fold Belt, east of the Gunnedah Basin and north of the Sydney Basin (Fig. 19–1). The Ashford seam has 60% (mmf) vitrinite and a medium semifusinite ratio (Fig. 19–5a). Microlithotypes in the Ashford seam are finely banded (Fig. 19–5c).

Cooper Basin. Early Permian coal measures in this basin are mainly within the Patchawarra Formation. Seams in this formation have low to medium vitrinite contents. The amount of "band macrinite" is less than or equal to the amount of semifusinite, but the semifusinite ratio is low, even if the band macrinite is added to the semifusinite (Fig. 19–6a). Exinite ranges between 1 and 9%

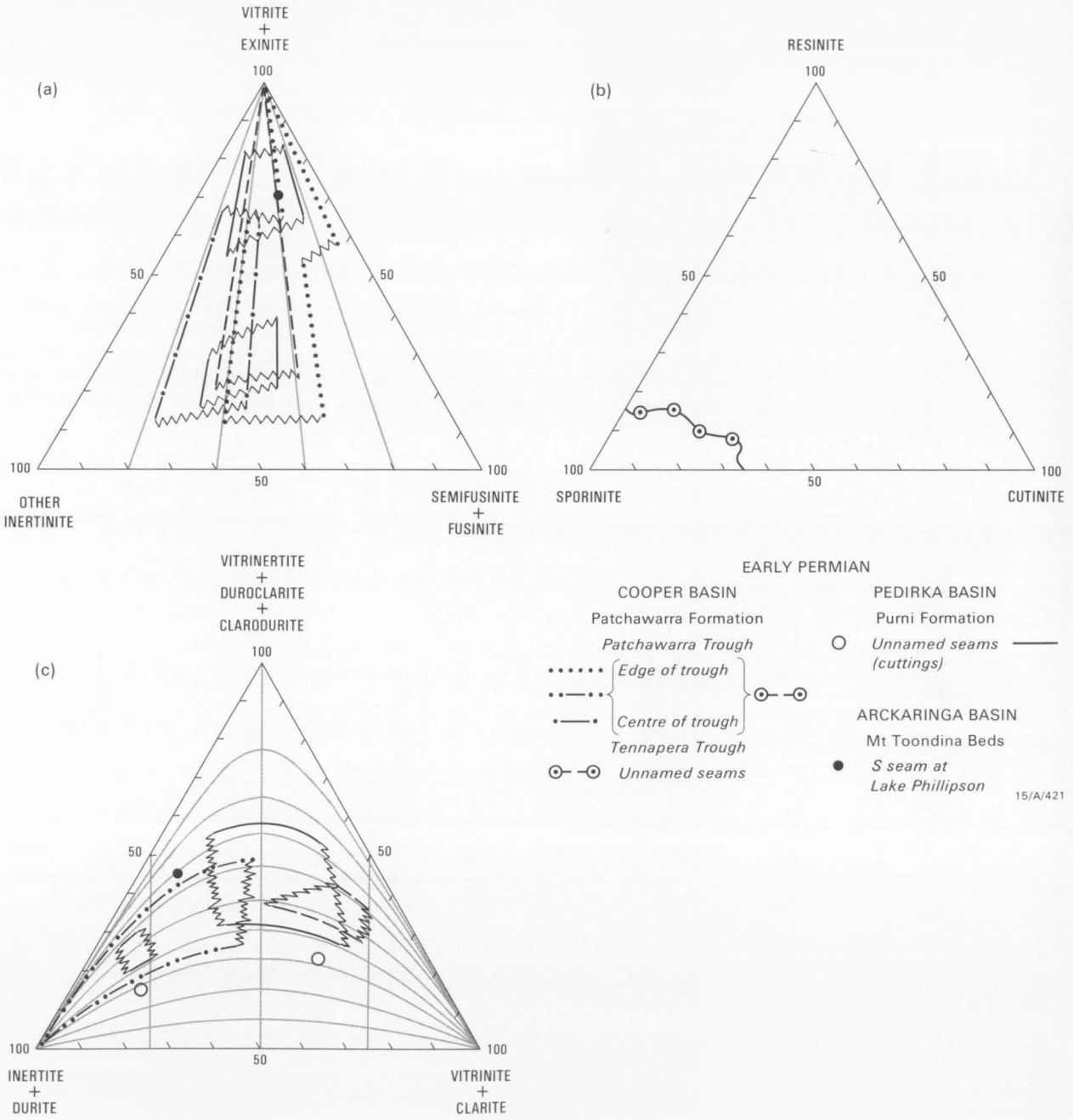


Fig. 19–6a. Maceral composition (mmf) of seams in the Patchawarra and Purni Formations and the Mt Toondina Beds from the Cooper, Pedirka and Arckaringa Basins.

Fig. 19–6b. Composition of exinite from seams in the Patchawarra Formation from the Cooper Basin. For symbols, see Fig. 19–6a.

Fig. 19–6c. Microlithotype composition (mmf) of seams in the Patchawarra and Purni Formations and the Mt Toondina Beds from the Cooper, Pedirka and Arckaringa Basins. For symbols, see Fig. 19–6a.

(mmf) and is dominantly sporinite with some cutinite (Fig. 19–6b). Cooper Basin coals are mainly finely banded (Fig. 19–6c).

Arckaringa Basin. This basin is an intracratonic Permian structure located in central Australia. A single seam analysed from the Mt. Toondina Formation has 70% (mmf) vitrinite and a low semifusinite ratio (Fig. 19–6a), and is finely banded (Fig. 19–6c).

Pedirka Basin. Early Permian coals are found in the Purni Formation in the Pedirka Basin. Maceral composition of coal cuttings from the Purni Formation in three wells in the basin is shown in Fig. 19–6a. The seams contain 50–60% (mmf) vitrinite on averages; the semifusinite ratio being mainly low. The microlithotypes are fine to very finely banded (Fig. 19–6c).

Late Permian

Marginal basins

Bowen Basin. Economic coal facies were developed in the Bowen Basin during the Late Permian. However, the frequency and thickness of widespread tuff bands in the middle of the sequence renders many of the coals uneconomic. The early Late Permian German Creek Formation is overlain by the marine MacMillan Formation, which interfingers with the partly lateral equivalent Moranbah Coal Measures. They, in turn, are overlain by either the uneconomically coal-bearing Fair Hill and Burngrove Formations, or Fort Cooper Coal Measures over most of the basin. Later in the Late Permian, economic coal facies formed throughout the basin. They are the Rangal Coal Measures in the north and centre, the Baralaba Coal Measures in the southeast, and the Bandanna Formation in the southwest (see Table 19–1).

Coals in the German Creek Formation have high vitrinite contents, with a medium semifusinite ratio (Fig. 19–7a); the microlithotypes are medium to finely banded (Fig. 19–7b). In the Moranbah Coal Measures, average vitrinite decreases from about 80% (mmf) in the south to 55% (mmf) in the north; the semifusinite ratio is medium to high (Fig. 19–7a); and microlithotypes in the Moranbah Coal Measures are medium banded (Fig. 19–7b).

Seams in the Fair Hill Formation in Emerald NS2 (Fig. 19–8a) have high-vitrinite contents and high semifusinite ratios (Hunt & Telfer, 1983c). The samples have 1.60 R.D. float fractions with low recoveries (7 to 35%). Vitrinite content in the Burngrove Formation from Emerald NS2 is generally high, as is the semifusinite ratio (Fig. 19–8a). Exinite in the Burngrove and Fair Hill Formations in Emerald NS2 ranges from 2 to 8% (mmf) and consists mainly of sporinite (Fig. 19–8b). The Fair Hill and Burngrove Formations contain medium banded microlithotypes (Fig. 19–8c).

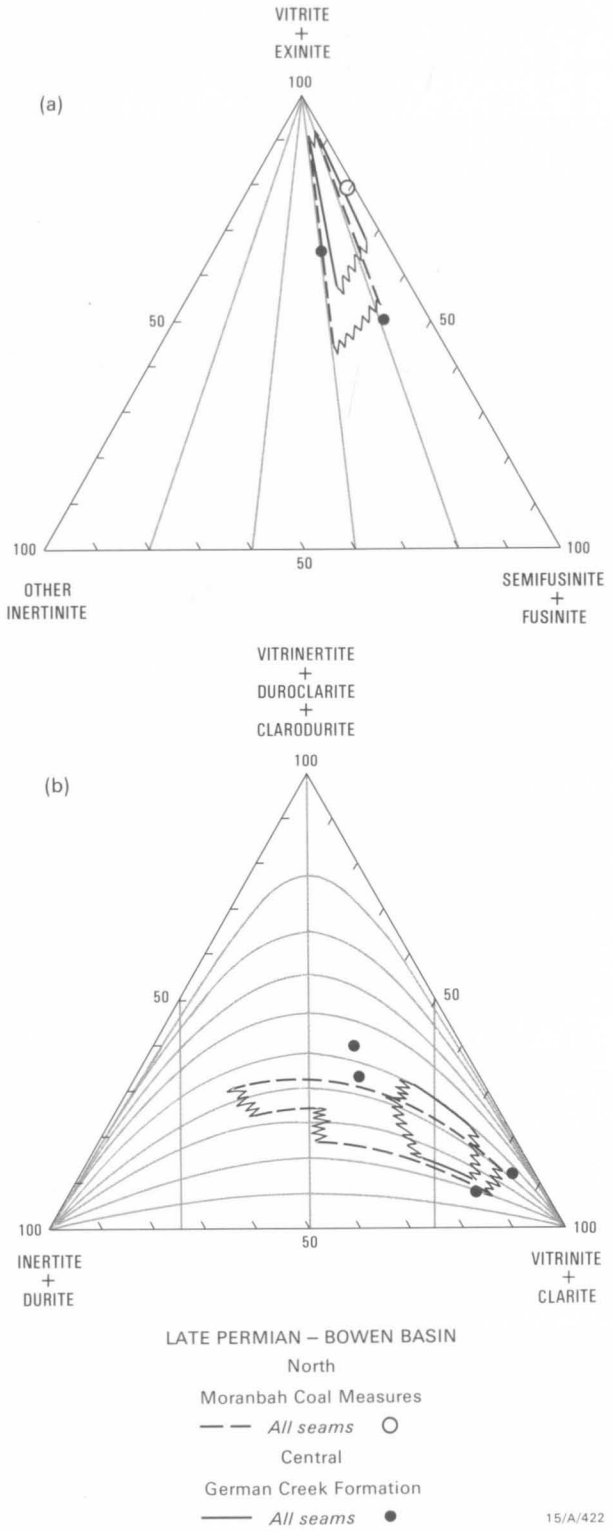


Fig. 19–7a. Maceral composition (mmf) of seams in the German Creek Formation and Moranbah Coal Measures from the northern Bowen Basin.

Fig. 19–7b. Microlithotype composition (mmf) of seams in the German Creek Formation and Moranbah Coal Measures from the northern Bowen Basin. For symbols, see Fig. 19–7a.

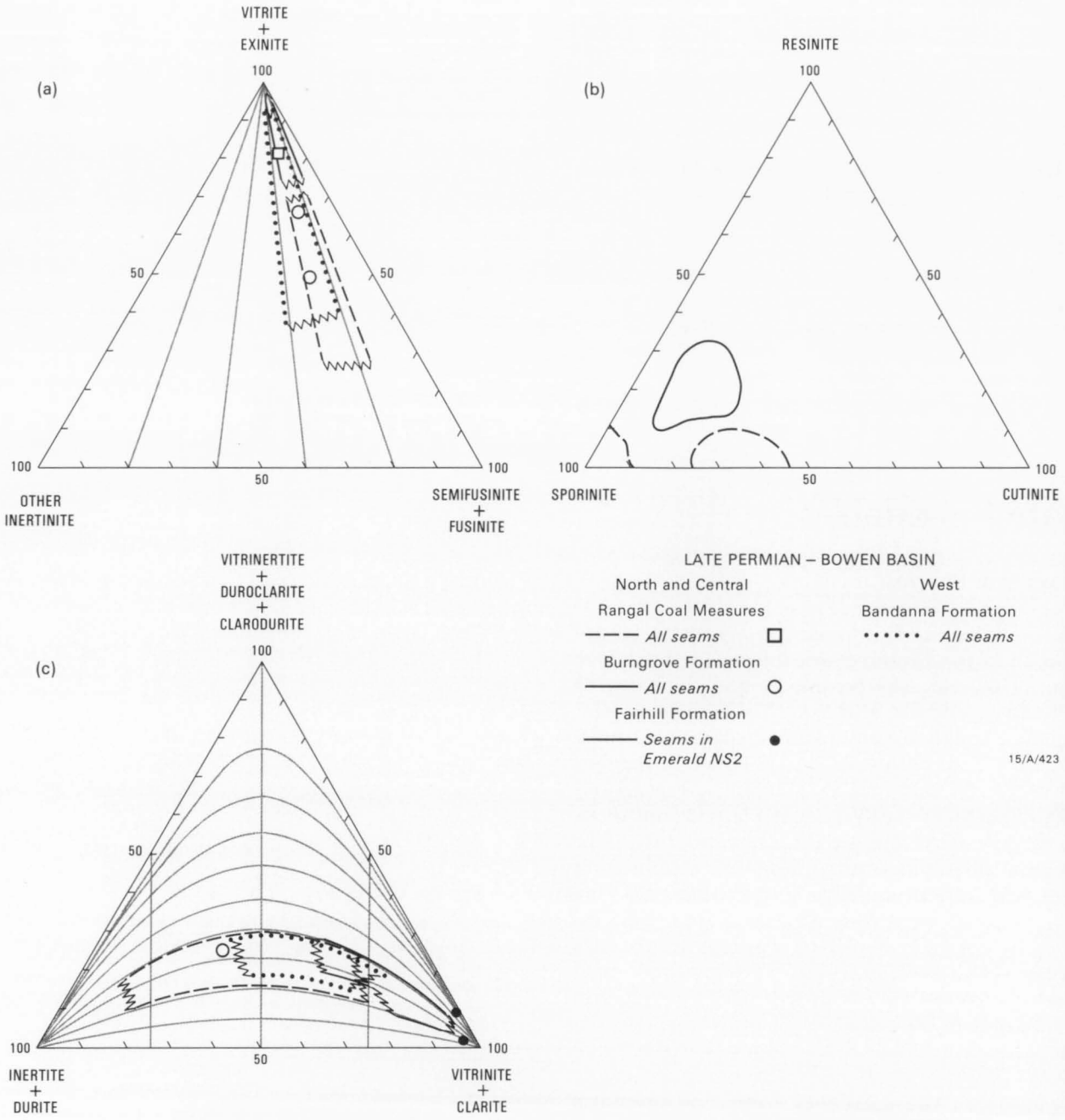


Fig. 19–8a. Maceral composition (mmf) of seams in the Fair Hill and Burngrove Formations, the Rangal Coal Measures and the Bandanna Formation from the central and southern Bowen Basin.

Fig. 19–8b. Composition of exinite from seams in the Fair Hill and Burngrove Formations and the Rangal Coal Measures from the central and southern Bowen Basin. For symbols, see Fig. 19–8a.

Fig. 19–8c. Microlithotype composition (mmf) of seams in the Fair Hill and Burngrove Formations, the Rangal Coal Measures and the Bandanna Formation from the central and southern Bowen Basin. For symbols, see Fig. 19–8a.

Vitrinite in the Rangal Coal Measures ranges from 30 to 60% (mmf) for the thinner sequence in the north, and 40 to 60% (mmf) for the thicker one in the central Bowen Basin. The semifusinite ratio is medium to high (Fig. 19–8a). Exinite ranges from 2 to 4% mmf and is chiefly of sporinite, but with significant amounts of cutinite (Fig. 19–8b). Microlithotypes in the Rangal Coal Measures are medium banded (Fig. 19–8c).

Seams in the basal Kaloola Member of the Baralaba Coal Measures in the southeast have mainly high vitrinite contents (Fig. 19–9a), and vitrinite is medium to high in the remainder of the sequence. The semifusinite ratio for the Baralaba Coal Measures is medium to high (Fig. 19–9a). Exinite ranges from 2 to 6% (mmf) and is mainly of sporinite, with lesser amounts of cutinite (Fig. 19–9b). The Baralaba Coal Measures contain medium

to finely banded microlithotypes in the south and medium-banded microlithotypes in the north (Fig. 19–9c).

Maceral composition of several seams in the Bandanna Formation from the Rolleston area in the southwest of the Bowen Basin is shown in Fig. 19–8a. The seams have from 40 to 80% (mmf) vitrinite; the semifusinite ratio is low to medium. Exinite ranges from 3 to 6% (mmf) and is mainly of sporinite. The microlithotypes are medium banded (Fig. 19–8c). There is a small, but noticeable, decrease in the semifusinite ratio from the Baralaba Coal Measures in the southeast to the Bandanna Formation in the southwest.

Gunnedah Basin. A limited number of petrographic analyses are available (Hunt & Telfer, 1983c) for seams in the Late Permian Black Jack Formation from the Gunnedah Basin. The lower and upper seams in the bore DMR Howes Hill DDH1 tend to be high in vitrinite, and the middle

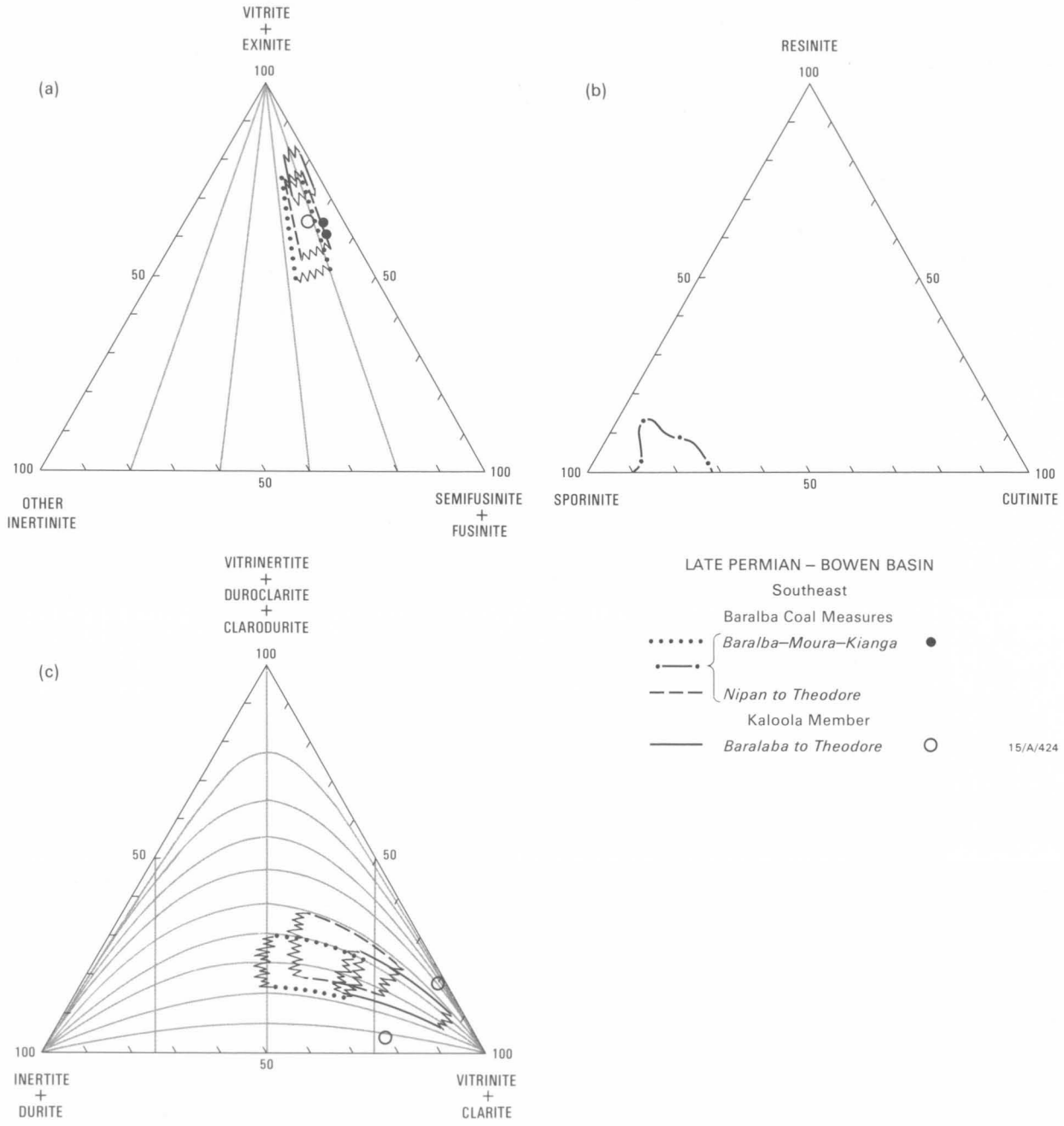


Fig. 19–9a. Maceral composition (mmf) of seams in the Baralaba Coal Measures and the Kaloola Member from the southeastern Bowen Basin.

Fig. 19–9b. Composition of exinite from seams in the Baralaba Coal Measures from the southeastern Bowen Basin. For symbols, see Fig. 19–9a.

Fig. 19–9c. Microlithotype composition (mmf) of seams in the Baralaba Coal Measures and the Kaloola Member from the southeastern Bowen Basin. For symbols, see Fig. 19–9a.

seams have low vitrinite contents. The semifusinite ratio is medium for the lower seams and upper seam, and low for the middle seams (Fig. 19–10a). Exinite ranges from 1 to 8% (mmf) and consists chiefly of sporinite (Fig. 19–10b). The Hoskissons seam, which is worked in the basin, may be correlative of the Bayswater seam in the Sydney Basin. Although it has a high vitrinite ply in the base, vitrinite is low overall. The semifusinite ratio for the Hoskissons seam is low (Fig. 19–10a). Exinite content is 6% (mmf) and is mainly of sporinite (Fig. 19–10b). The Black Jack Formation has medium to finely banded microlithotypes (Fig. 19–10c).

Sydney Basin. Coal-bearing facies formed throughout the Late Permian in the Sydney Basin. In the northeast around Newcastle, the Tomago and overlying Newcastle Coal Measures have mainly economic coal throughout; except for a barren interval in the middle of the Tomago and

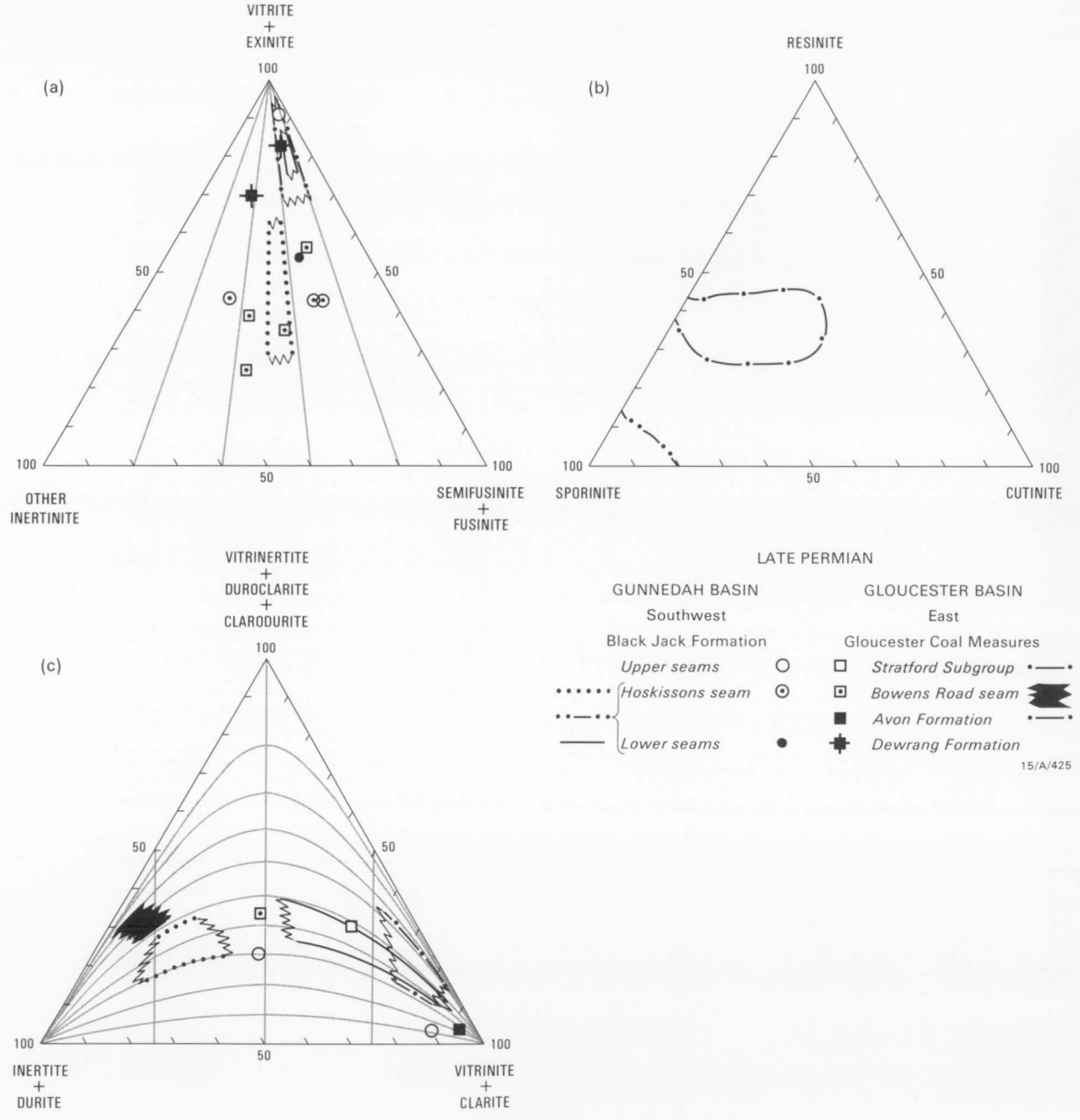


Fig. 19–10a. **Maceral composition (mmf) of seams in the Black Jack Formation and the Gloucester Coal Measures from the Gunnedah and Gloucester Basins.**

Fig. 19–10b. **Composition of exinite from seams in the Black Jack Formation and the Gloucester Coal Measures from the Gunnedah and Gloucester Basins. For symbols, see Fig. 19–10a.**

Fig. 19–10c. **Microlithotype composition (mmf) of seams in the Black Jack Formation and the Gloucester Coal Measures from the Gunnedah and Gloucester Basins. For symbols, see Fig. 19–10a.**

tuff-banded coals in the middle of the Newcastle Coal Measures. Their equivalents in the Upper Hunter Valley to the north are, respectively, the Wittingham and overlying Wollombi Coal Measures, and the latter are often highly tuff-banded and, thus, uneconomic. In the south and west of the Sydney Basin, the Illawarra Coal Measures contain chiefly economic equivalents of the northern sequences (Table 19–1).

In the northeast, vitrinite content is high for the Tomago Coal Measures and lower seams in the Newcastle Coal Measures, and low to medium for the upper seams in the Newcastle Coal Measures. The semifusinite ratio is medium to high (Fig. 19–11a). Exinite ranges from 1 to 6% (mmf) and is composed dominantly of sporinite with a significant amount of cutinite in the upper sub-groups and resinite in the lower sub-groups (Fig. 19–11b). The Tomago and Newcastle Coal Measures show mainly medium banded microlithotypes (Fig. 19–11c).

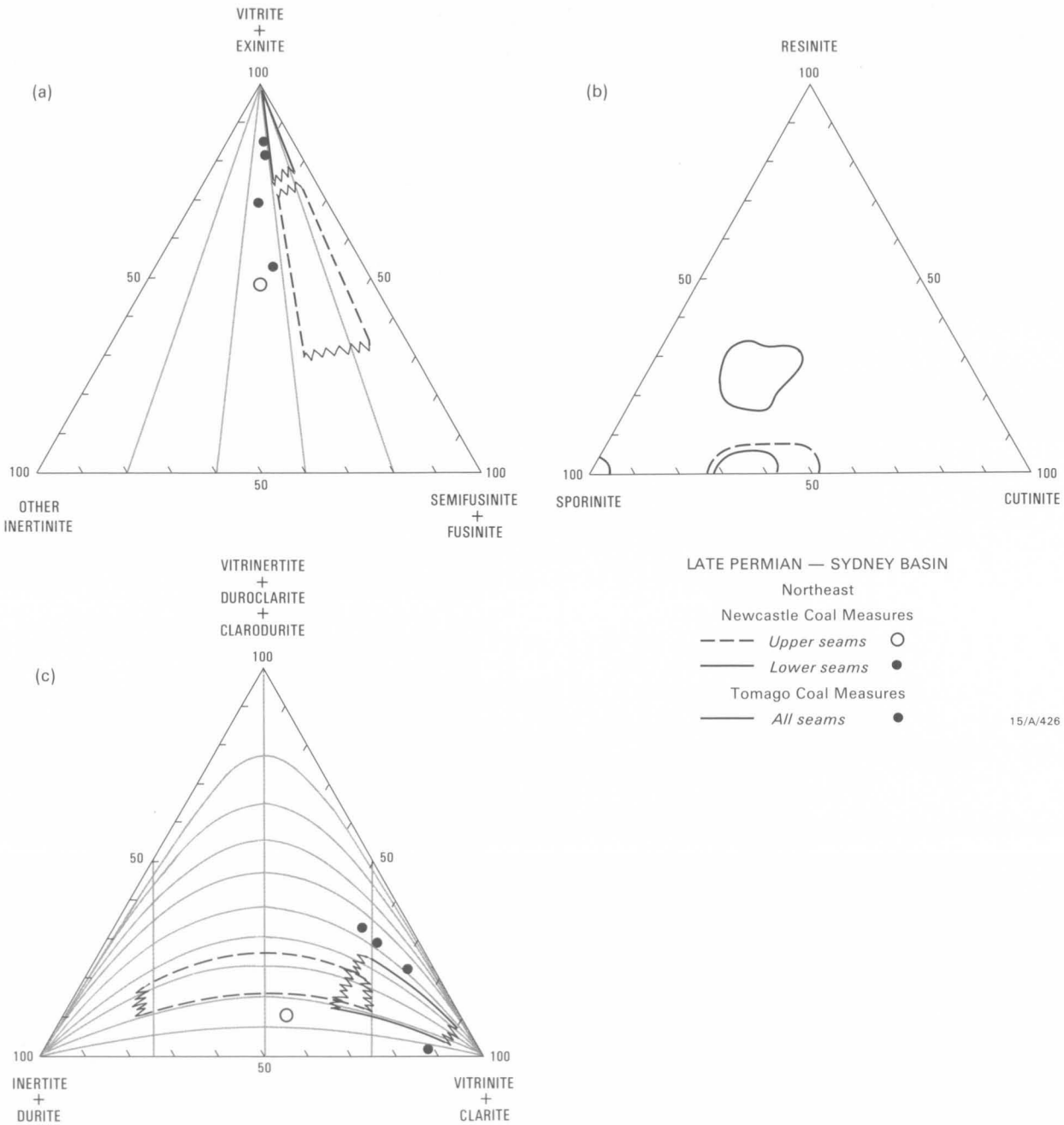


Fig. 19–11a. Maceral composition (mmf) of seams in the Tomago and Newcastle Coal Measures from the northeastern Sydney Basin.

Fig. 19–11b. Composition of exinite from seams in the Newcastle Coal Measures from the northeastern Sydney Basin. For symbols, see Fig. 19–11a.

Fig. 19–11c. Microlithotype composition (mmf) of seams in the Newcastle Coal Measures from the northeastern Sydney Basin. For symbols, see Fig. 19–11a.

Vitrinite in the Wittingham Coal Measures is usually high except for the Bayswater seam, with 25 to 40% (mmf). The semifusinite ratio is medium to high for most seams, except the Bayswater seam which is low (Fig. 19–12a). Exinite ranges from 2 to 10% (mmf) and consists of sporinite, with up to 40% resinite (Hunt & Telfer, 1983c) (Fig. 19–12b). The Wittingham Coal Measures have medium to finely banded microlithotypes (Fig. 19–12c).

The basal seam (Woonona) in the upper subgroup of the Illawarra Coal Measures is low in vitrinite amount with very finely banded microlithotypes (Fig. 19–13c). The lower overlying seams are high in vitrinite and the upper seams have low to medium vitrinite contents. The semifusinite ratio is medium for most seams (Fig. 19–13a), although there is no data for the Woonona seam.

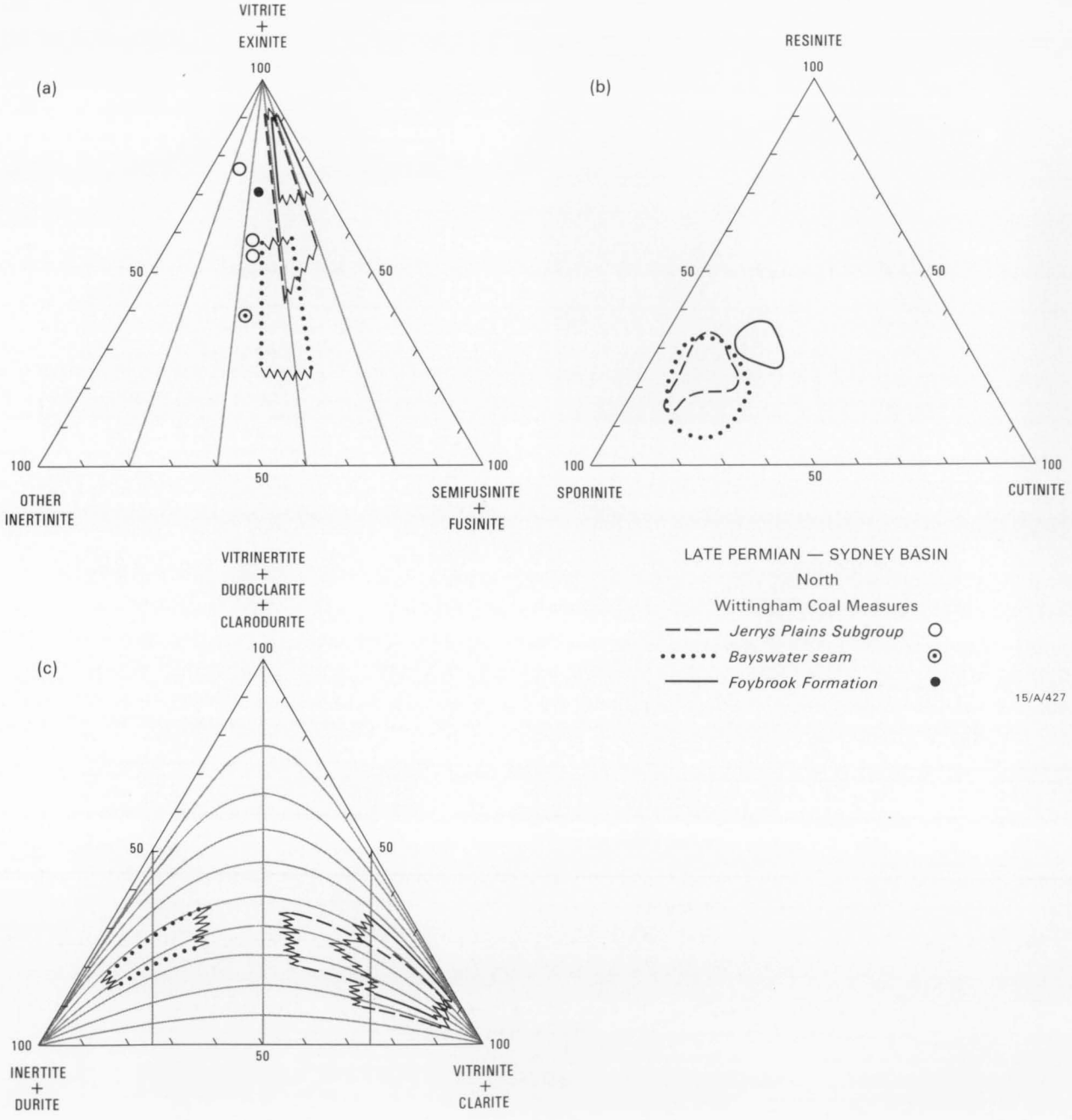


Fig. 19–12a. Maceral composition (mmf) of seams in the Wittingham Coal Measures from the northern Sydney Basin.

Fig. 19–12b. Composition of exinite from seams in the Wittingham Coal Measures from the northern Sydney Basin. For symbols, see Fig. 19–12a.

Fig. 19–12c. Microlithotype composition (mmf) of seams in the Wittingham Coal Measures from the northern Sydney Basin. For symbols, see Fig. 19–12a.

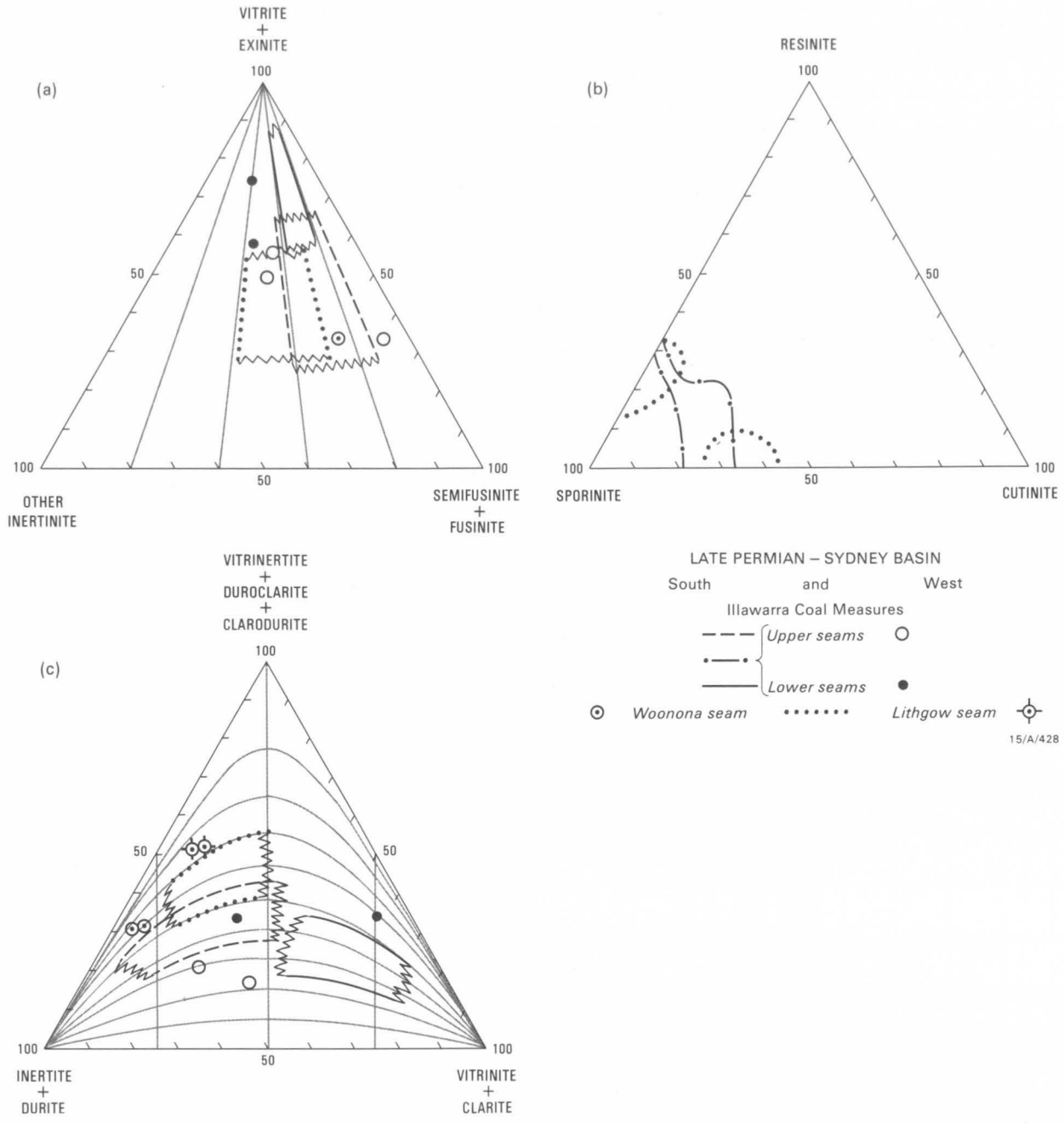


Fig. 19–13a. Maceral composition (mmf) of seams in the Illawarra Coal Measures from the southern and western Sydney Basin.

Fig. 19–13b. Composition of exinite from seams in the Illawarra Coal Measures from the southern and western Sydney Basin. For symbols, see Fig. 19–13a.

Fig. 19–13c. Microlithotype composition (mmf) of seams in the Illawarra Coal Measures from the southern and western Sydney Basin. For symbols, see Fig. 19–13a.

The basal seams (Lithgow and Lidsdale) in the upper sub-group of the Illawarra Coal Measures in the west are low to medium in vitrinite (Fig. 19–13a) and finely to very finely banded (Fig. 19–13c). A seam in the Ulan area to the north (Ulan seam), in a similar stratigraphic position to the Lithgow seam, is also low in vitrinite. The lower overlying seams are high in vitrinite, and the upper seams have low to medium vitrinite contents. The semifusinite ratio for the Lithgow and Ulan seams is low to medium, and for the overlying seams is medium (Fig. 19–13a). Exinite ranges from 2 to 10% (mmf) and is composed mainly of sporinite (Fig. 19–13b) (Hunt & Telfer, 1983d). Microlithotypes in the lower vitrinite-rich seams are medium to finely banded and in the upper seams finely banded (Fig. 19–13c).

Gloucester Basin. The Gloucester Basin lies in the axis of a synclinal structure, which originated in the northeast of the Sydney Basin. This basin

contains a Late Permian sequence of mainly high-vitrinite coals in the Gloucester Coal Measures and Dewrang Formation, excluding the upper subsections of the Bowens Road seam. The semifusinite ratio is medium to high, except in the top of the Bowens Road seam where it is low (Fig. 19–10a). Exinite consists of sporinite with some resinite (Fig. 19–10b) and the microlithotypes are medium to finely banded (Fig. 19–10c) (Hunt & others, 1983).

Intracratonic basins

Calilee Basin. A thin sequence of Late Permian coal measures in the Bandanna Formation is exposed only along the eastern margin of the Galilee Basin and analytical data are available for 300 km along strike (Beeston, 1977). Vitrinite content is high throughout the sequence in the southeast; northward along strike, vitrinite decreases down

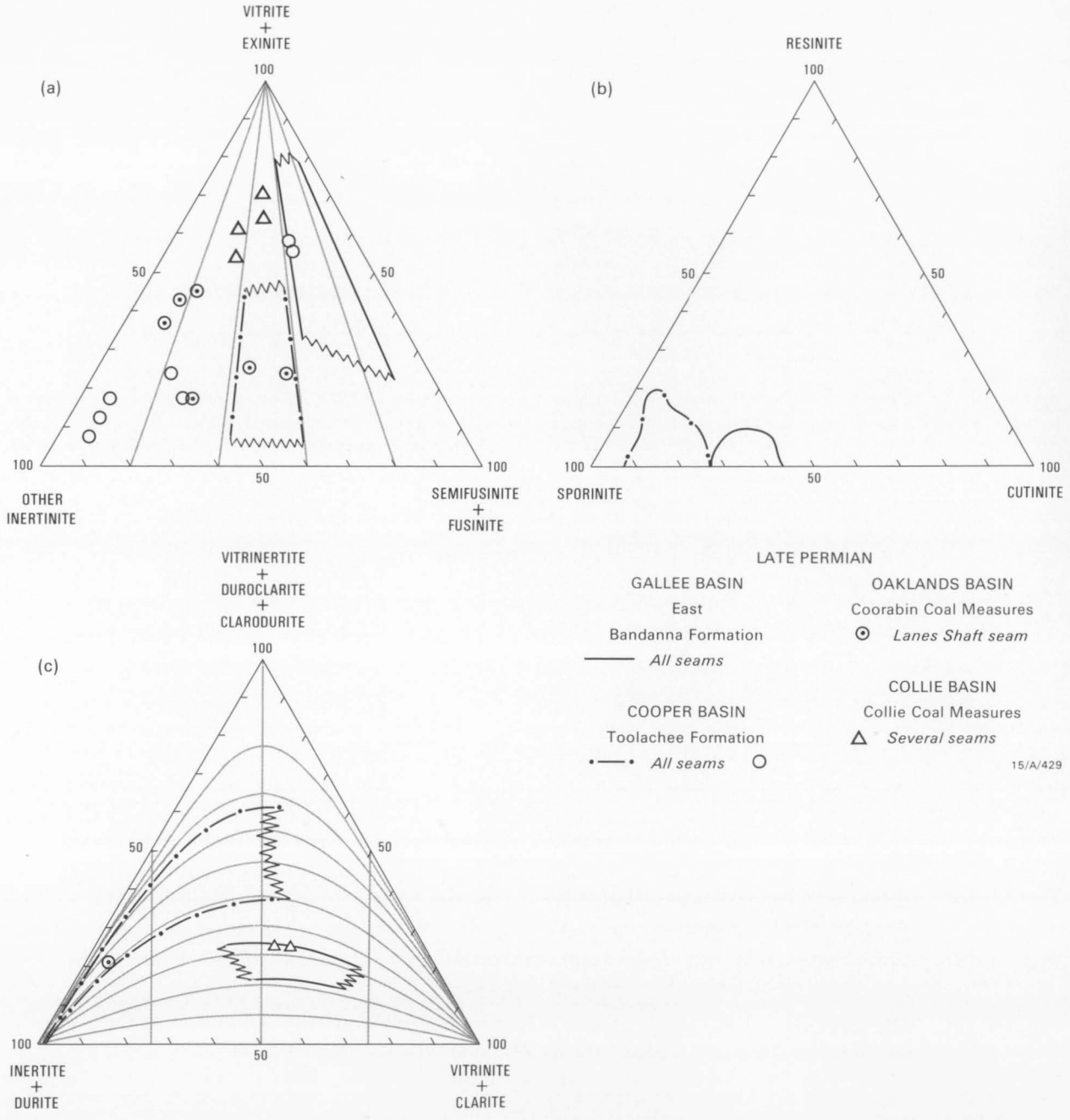


Fig. 19–14a. Maceral composition (mmf) of seams in the Bandanna and Toolachee Formations, and the Coorabin and Collie Coal Measures from the Galilee, Cooper, Oaklands and Collie Basins.

Fig. 19–14b. Composition of exinite from seams in the Bandanna and Toolachee Formations from the Galilee and Cooper Basins. For symbols, see Fig. 19–14a.

Fig. 19–14c. Microlithotype composition (mmf) of seams in the Bandanna and Toolachee Formations, and the Coorabin and Collie Coal Measures from the Galilee, Cooper, Oaklands and Collie Basins. For symbols, see Fig. 19–14a.

the sequence and in the north is low throughout the whole of the sequence. At Degulla in the south, the semifusinite ratio is low to medium (Fig. 19–14a). Exinite at Degulla ranges from 2 to 12% (mmf) and is composed of sporinite and cutinite (Fig. 19–14b). The microlithotypes at Degulla are medium banded (Fig. 19–14c).

Cooper Basin. Late Permian coal measures in the Toolachee Formation of the Cooper Basin are known from petroleum drilling, but petrographic data are available only from the southern (South Australian) half of the basin.

Seams in the Patchawarra and Nappamerri troughs are generally low to medium in vitrinite with a low semifusinite ratio (Fig. 19–14a). Exinite ranges from 2 to 8% (mmf) and consists of sporinite with minor cutinite (Fig. 19–14b). The Toolachee Formation contains fine to very finely banded microlithotypes (Fig. 19–14c).

Oaklands Basin. The Coorabin Coal Measures in the top of the Oaklands Basin sequence has only a few seams. The thick basal seam (Lanes Shaft seam) contains merely 25% (mmf) vitrinite and the semifusinite ratio is very low (Fig. 19–14a). The microlithotypes are finely to very finely banded (Fig. 19–14c). Exinite ranges from 5 to 20% (mmf) and consists mainly of sporinite.

Collie Basin. The Collie Basin is a small fault-bounded measure sequence. The Hebe seam analysed from the Late Permian Muja Member in the Muja Sub-basin has 56% vitrinite (mmf) and a very low semifusinite ratio (Fig. 19–14a). Seams from the Colliburn and Cardiff Members of the Cardiff Sub-basin contain 60–70% vitrinite (mmf) and have a low semifusinite ratio (Fig. 19–14a). The Collie Coal Measures consist of medium banded microlithotypes (Fig. 19–14c).

Discussion

Trends in petrographic composition of the Permian coals are discussed in the following section; variation in petrography is summarised in Tables 19–2 to 4 by age and basin.

TABLE 19–2. SUMMARY OF PETROGRAPHIC COMPOSITION OF EARLY PERMIAN SEAMS IN THE MARGINAL BASINS

Basin	*Formation and location*	*Banding of the microlithotypes*	*Vitrinite content*	*Exinite type*	*Semifusinite ratio*
Bowen	Reids Dome beds Denison Trough	Fine to v. fine	Med. to high	sp.	Low to med.
	Collinsville C.M. at Collinsville	Medium	Med. to high	sp.	Med.
	at Rugby*	-	Low	-	-
Gunnedah	Maules Creek Fm. in the northeast	Medium to fine	High	sp. > res.	Med.
	Leard Fm. in the southwest*	Medium	Low	sp. > res.	Low
Sydney	Greta C.M. at Cessnock and Muswellbrook	Fine to v. fine	High	sp.	Low
	Clyde C.M.* in the Clyde River gorge	V. fine	Med. to high	sp. and cut.	Low

See Figs 19–3 and 4 for an explanation of the categories.
* Few data. sp. = sporinite, res. = resinite, cut. = cutinite.

TABLE 19–3. SUMMARY OF PETROGRAPHIC COMPOSITION OF EARLY PERMIAN SEAMS IN THE INTRACRATONIC BASINS

Basin	*Formation and location*	*Banding of the microlithotypes*	*Vitrinite content*	*Exinite type*	*Semifusinite ratio*
Cooper	Patchawarra Fm. in the south	Fine	Low > med.	sp.	Low to v. low
Arckaringa	Mt. Toondina Fm.*	Fine	High	-	Low
Pedirka	Purni Fm.*	Fine to v. fine	Medium	-	Low
Blair Athol and Wolfang	Blair Athol C.M. upper seams	Fine	High	sp.	Med. to high
	Big seam	Fine	Low	sp.	Low
Ashford	Ashford C.M.*	Fine	Med. to high	-	Med.

See Figs 19–3 and 4 for an explanation of the categories.
* Few data. sp. = sporinite, res. = resinite, cut. = cutinite.

TABLE 19–4. SUMMARY OF PETROGRAPHIC COMPOSITION OF EARLY PERMIAN SEAMS IN THE TRANSFORM BASINS

Basin	*Formation and location*	*Banding of the microlithotypes*	*Vitrinite content*	*Exinite type*	*Semifusinite ratio*
Bowen	Baralaba C.M. in the southeast	Med. > fine	Med. < high	sp.	Med. to high
	Rangal C.M. in the centre and north	Medium	Low to high	sp. > cut.	Med. to high
	Bandanna Fm. in the southwest	Med. to fine	Med. to high	sp.	Low < med.
	Burngrove and Fairhill Fms* in the centre*	Medium	High	sp.	Medium
	Moranbah C.M. in the north	Medium	Med. < high	-	Medium
	German Creek Fm. in the centre	Med. to fine	High	-	Medium
Gunnedah	Black Jack Fm.* in the southwest				
	lower & upper seams	Med. to fine	High	sp.	Medium
	Hoskissons seam	Med. to fine	Low to med.	sp.	Low
Sydney	Illawarra C.M. in the south & west				
	upper seams	Fine	Low to med.	sp.	Med.
	lower seams	Med. to fine	High	sp.	Med.
	Lithgow & Woonona* seams	Fine to v. fine	Low	sp.	Low
	Newcastle C.M. in the northeast				
	upper seams	Med.	Low to high	sp. > cut.	Med.
	lower seams	Med. to fine	High	sp. > cut.	Med.
	Tomago C.M.	Med. to fine	High	sp. > cut.	Med.
	Wittingham C.M. in the north				
	upper & lower seams	Med. to fine	High	sp. > res.	Med.
	Bayswater seam	Fine	Low to med.	sp.	Low
Gloucester	Gloucester C.M.*				
	upper & lower seams	Med. to high	High	sp. > res.	Med.
	Bowens Road seam	High to v. high	Low to med.	sp. > res.	Low > med.

See Figs 19–3 and 4 for an explanation of the categories.
* Few data. sp. = sporinite, res. = resinite, cut. = cutinite.

Microlithotypes

The concept that Early Permian coals are in general more finely banded than Late Permian coals is supported by data in Chapter 19. However, the overlap of banding type is considerable, with Early Permian coals ranging between banding coefficients (h) 3 and 9 (most results) (Figs 19–15 and 16) and Late Permian coals between (h) 2 and 8 (Figs 19–17 and 18).

In the marginal basins, the band width of the microlithotypes in the Early Permian coals decreases from medium to very fine and the semifusinite ratio from medium to low, respectively from the Bowen through the Gunnedah Basin to the Sydney Basin.

Within the Late Permian, coarsening of band width with decreasing age is apparent for trough sequences: e.g., the Tomago to Newcastle Coal Measures (Fig. 19–11c) in the Sydney Basin, and German Creek and Moranbah to the Rangal Coal Measures (Fig. 19–7b) in the Bowen Basin. Shelf sequences are less predictable: the Illawarra Coal Measures (Fig. 19–13c) in the southern Sydney Basin become more finely banded upwards, possibly reflecting subtle changes in subsidence and sedimentation rates. Banding of the microlithotypes for the Bayswater seam horizon in the Sydney Basin varies from medium along the northeastern margin of the basin, to fine and very fine at the southern and western margins. A similar trend is also apparent along the top of the coal measures in the Sydney Basin.

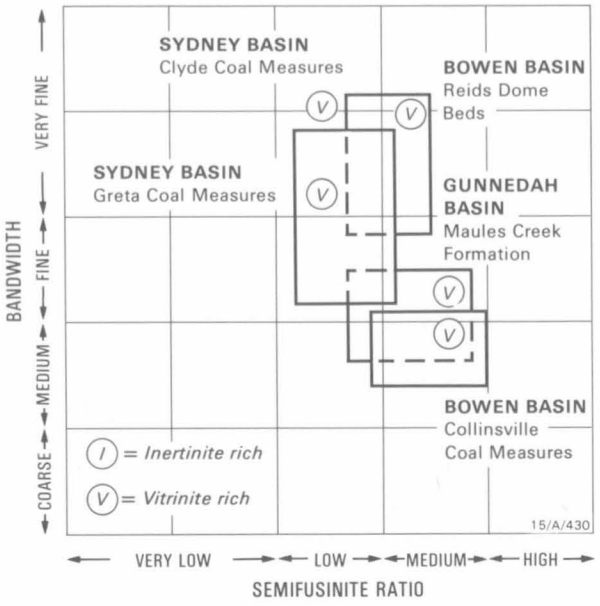


Fig. 19–15. Variation in maceral and microlithotype composition of Early Permian seams in the marginal basins.

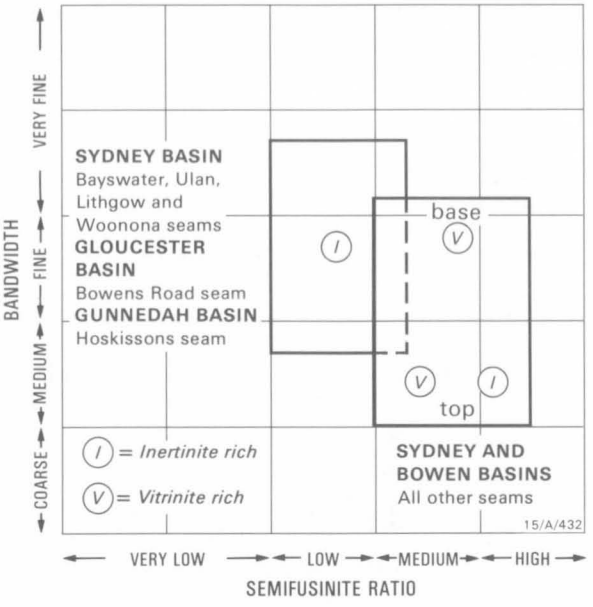


Fig. 19–17. Variation in maceral and microlithotype composition of Late Permian seams in the marginal basins.

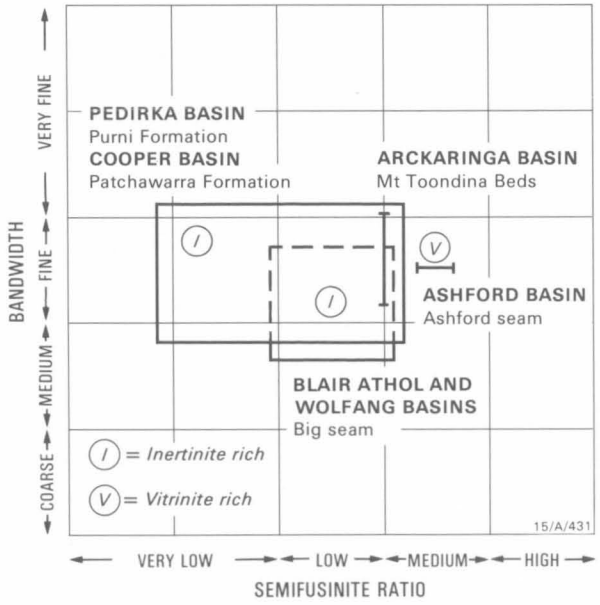


Fig. 19–16. Variation in maceral and microlithotype composition of Early Permian seams in the intracratonic basins.

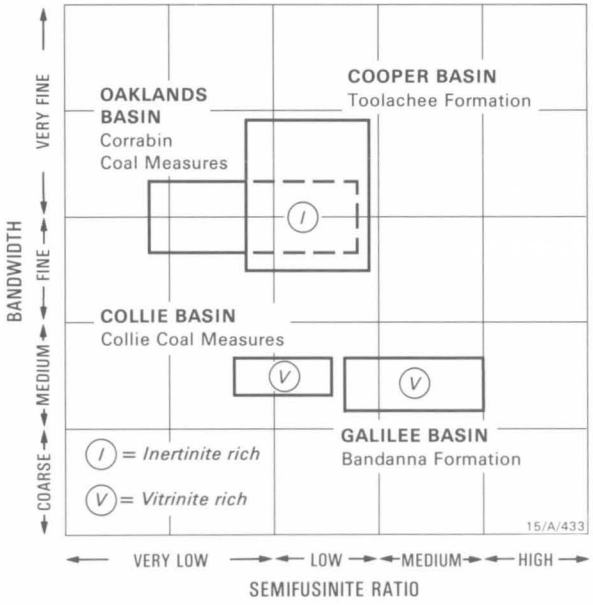


Fig. 19–18. Variation in maceral and microlithotype composition of Late Permian seams in the intracratonic basins.

Both the Early and Late Permian coals of the large intracratonic Cooper Basin (Figs 19–16 and 18) are finely banded, and, in the case of the small intracratonic basins (Blair Athol, Wolfang, Oaklands, Ashford and Collie), have finer banded microlithotypes.

Macerals

Vitrinite and exinite content

Vitrinite (+ exinite) content (mmf) (or the vitrinite + exinite/inertinite ratio) is measured on the vertical axis of the diagrams showing the

semifusinite ratio as being characteristically variable for Permian coals as a whole. Less variability is apparent when the coals are examined on the basis of age and basin.

The Early Permian marginal basins contain mainly high-vitrinite coals (Fig. 19–15) with a few exceptions in the Collinsville Coal Measures at Rugby, and the Leard Formation and the base of the Greta Coal Measures at Muswellbrook. The large intracratonic Cooper and small intracratonic Blair Athol and Wolfang Basins (Fig. 19–16) have chiefly low-vitrinite coals. However, the small intracratonic Ashford Basin has a high-vitrinite coal (Fig. 19–16).

The Late Permian marginal basins (Fig. 19–17) comprise dominantly high-vitrinite coals at the base, with the exception of the Woonona, Lithgow, Ulan, Bayswater, Hoskissons, and Bowens Road seams (hereafter called the Bayswater seam horizon) in the Sydney, Gunnedah and Gloucester Basins. Vitrinite content in the top of the marginal basins is variable, but mainly low to medium.

The Late Permian large intracratonic basins (Fig. 19–18) have dominantly low vitrinite coals, although there is a progressive north to south increase from low to high in the Galilee Basin. The small intracratonic Oaklands Basin has a thick low vitrinite seam, but the Collie Basin high-vitrinite coals.

Exinite content is generally higher on average in the Early Permian (5–15%) than in the Late Permian (0–10%), and the exinite is predominantly sporinite, but with a greater variability in the Early Permian than in the Late Permian, and with some resinite-rich seams in the latter. The resinite-rich seams in the Sydney and Gunnedah Basins are located along the northeastern orogenic margin.

Semifusinite ratio

The semifusinite-ratio data in this chapter are based mainly on seam composites. Subsection data for representative seams follow the same pattern as the composite data.

Early Permian coals generally show lower and more variable semifusinite ratios than Late Permian coals. Only the Maules Creek Formation in the Gunnedah Basin, the Collinsville Coal Measures in the Bowen Basin, and upper seams of the Wolfang Basin, have coals with consistently medium semifusinite ratios (Fig. 19–15); all other Early Permian coals have low to very low semifusinite ratios irrespective of vitrinite content (Figs 19–15 and 16).

Late Permian coals in the marginal basins have mainly medium to high semifusinite ratios across a wide range of vitrinite content (30 to 100%) (Fig. 19–17), with the exception of the Bayswater seam horizon which extends across both shelf and trough tectonic elements. In the Bowen Basin, there is a small but regular decrease in semifusinite ratio from high in the southeastern Baralaba Coal Measures, through the Rangal Coal Measures in the centre, to medium for the Bandanna Formation in the west.

The Late Permian intracratonic basins (Fig. 19–18) generally contain coals with low to very low semifusinite ratios, excepting the seams in the southern Galilee Basin. No data are available for the northern Galilee Basin.

Lateral Variation in Petrographic Composition

Palaeogeographic maps with lateral variation in vitrinite content have been constructed for one Early Permian and three Late Permian horizons shown in Table 19–1, and it is not clear if the horizons are time equivalent in the basins. The horizons have been chosen to coincide with major changes in average petrographic composition with time, and are based on bore or mine data given in the CSIRO Data Base (see microfiches).

Middle coal measures

Economic late Early Permian coals in the Sydney, Gunnedah and Bowen Basins are mainly vitrinite-rich with the exception of those in the Blair Athol and Wolfang Basins (Figs 19–19 and 20). Early Permian coals at depth in the Cooper Basin are mainly vitrinite-poor.

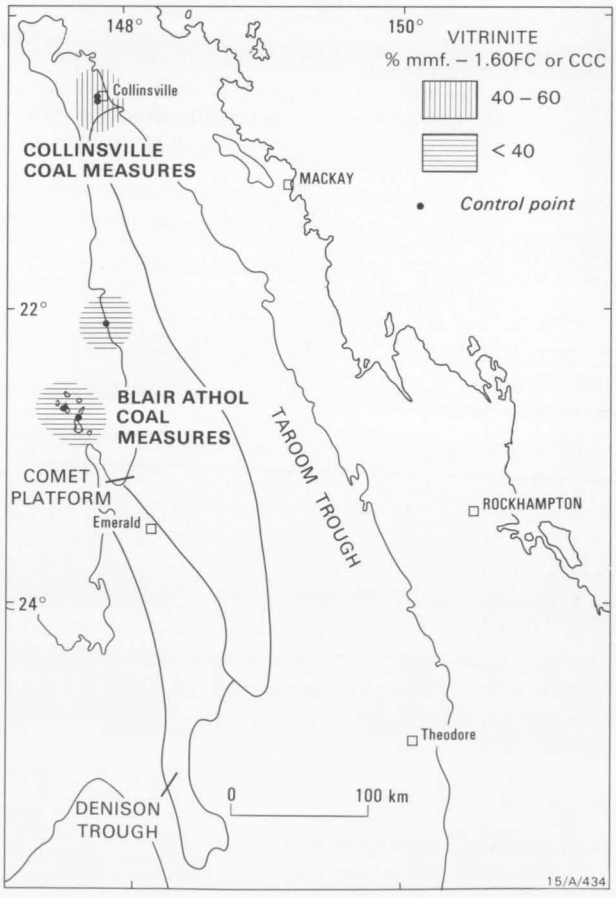


Fig. 19–19. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of middle coal measures from the Bowen, Blair Athol and Wolfang Basins.

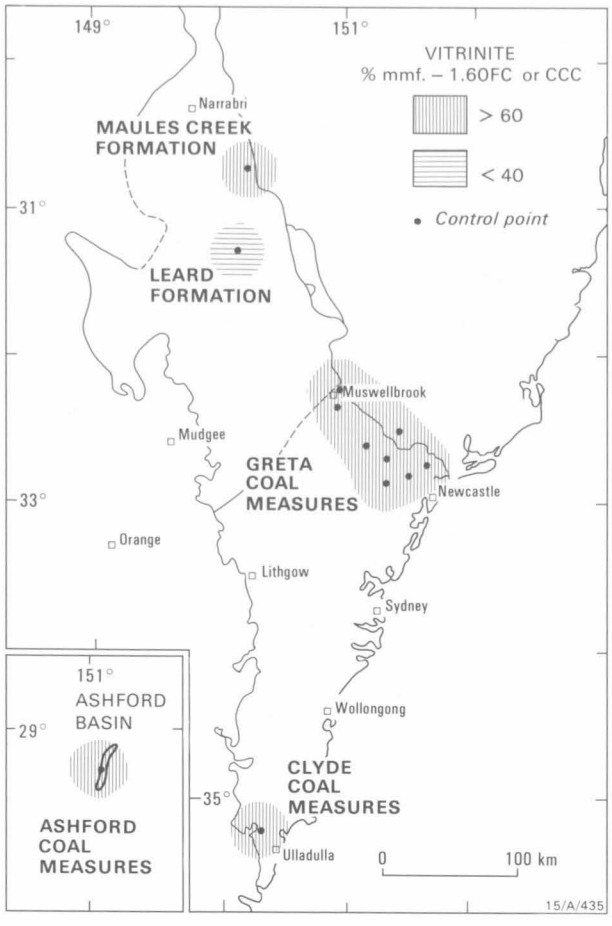


Fig. 19–20. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of middle coal measures from the Sydney, Gunnedah and Ashford Basins.

Lower part of upper coal measures

The majority of early Late Permian coals in the Sydney, Gunnedah and Bowen basins are vitrinite rich (Figs 19–21 and 22). In the Bowen Basin, this horizon is based only on the German Creek Formation and Moranbah Coal Measures. The overlying, uneconomic coal-bearing Fort Cooper Coal Measures and Fair Hill Formation also have high vitrinite coals, on the basis of limited sampling (Hunt & Telfer, 1983d).

Vitrinite content decreases in the Bowen Basin from south to north, probably paralleling the regional palaeoslope. In the Sydney Basin, several minor low vitrinite coals (American Creek seam) which were rarely sampled, are intercalated in the sequence in the south and west.

Bayswater seam horizon

The Bayswater seam horizon is a distinctive low-vitrinite horizon present in the Sydney Basin (Bayswater, Ulan, Lithgow and Woonona seams), Gunnedah Basin (Hoskissons seam), and the Gloucester Basin (Bowens Road seam). Although a vitrinite-rich basal section is usually present, the seams have a low to medium vitrinite content on a whole-seam basis (Fig. 19–23). In the Gunnedah Basin, the Hoskisson seam coal facies appears to be present in several overlying seams, and may have persisted over a much longer period.

Top part of upper coal measures

Petrographic and geochemical characterisation of this sequence is based on the top one or two seams in the thinner northern sequence of the Bowen Basin and the southern and western deposits of the Sydney Basin. From elsewhere in the thicker equivalent units, average values for several seams are presented. Considerable vertical and lateral variation in vitrinite percentages is apparent. A study of the petrographical and geochemical variation in relationship to depositional environment for a small part of this sequence was made by Hunt & Hobday (1984). In the Galilee and Bowen Basins, vitrinite content tends to increase from low in the north to high in the south (Figs 19–24 and 25), although one anomalously high vitrinite section is apparent in the north of the

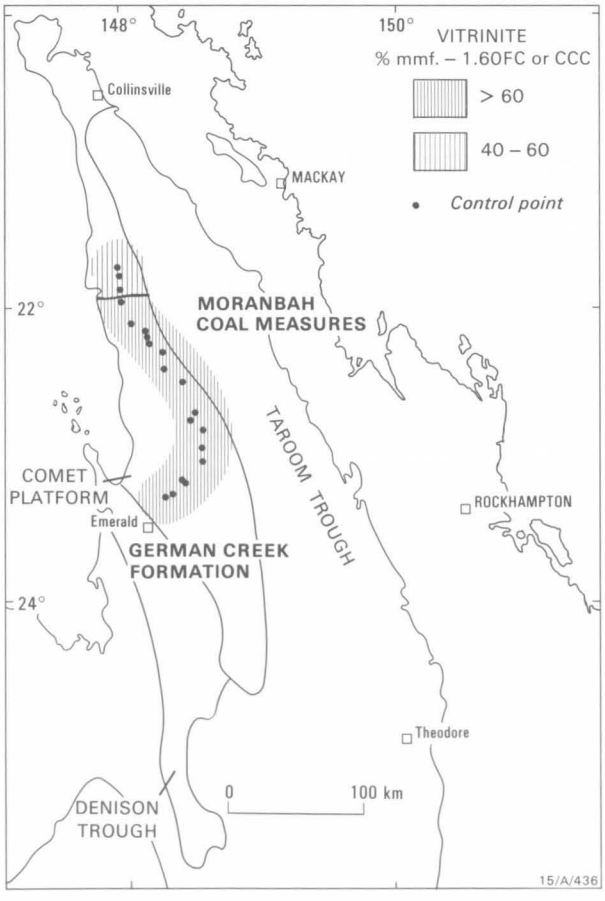


Fig. 19–21. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of lower part of upper coal measures from the Bowen Basin.

Bowen Basin. In the Sydney Basin, vitrinite content is low to medium in the south and west, and medium to high in the northeast (Fig. 19–26). Although macroscopically dull coals occur in the top of the Gunnedah Basin, analysis of one seam showed it to be high in vitrinite with high disseminated mineral matter. It is not known at this time if the top of the sequence in the Gunnedah Basin is equivalent to the top of the coal measures in the Sydney and Bowen Basins.

TABLE 19–5. SUMMARY OF PETROGRAPHIC COMPOSITION OF LATE PERMIAN SEAMS IN THE INTRACRATONIC BASINS

Basin	*Formation and location*	*Banding of the microlithotypes*	*Vitrinite content*	*Exinite type*	*Semifusinite ratio*
Galilee	Bandanna Fm.* in the northeast & southeast	Medium	Low to high	sp. > cut.	Med. to high
Cooper	Toolachee Fm.*	Fine to v. fine	Low > med.	sp.	Low
Oaklands	Coorabin C.M.	Fine	Low	sp.	Low to v. low
Collie	Collie C.M.*	Medium	High	-	Low — v. low v. low

See Figs 19–3 and 4 for an explanation of the categories.
* Few data. sp. = sporinite, res. = resinite, cut. = cutinite.

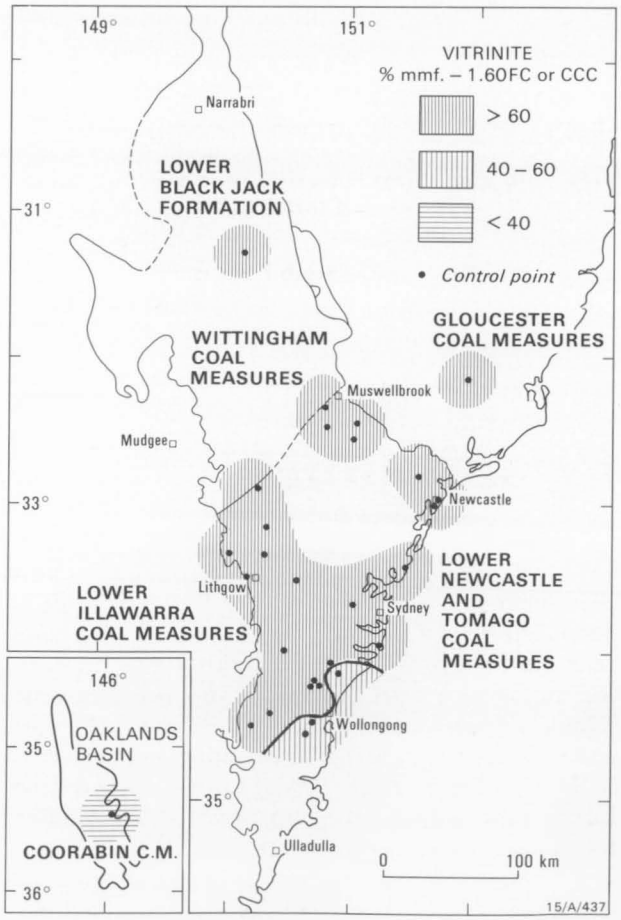


Fig. 19–22. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of lower part of upper coal measures from the Sydney, Gunnedah and Gloucester Basins.

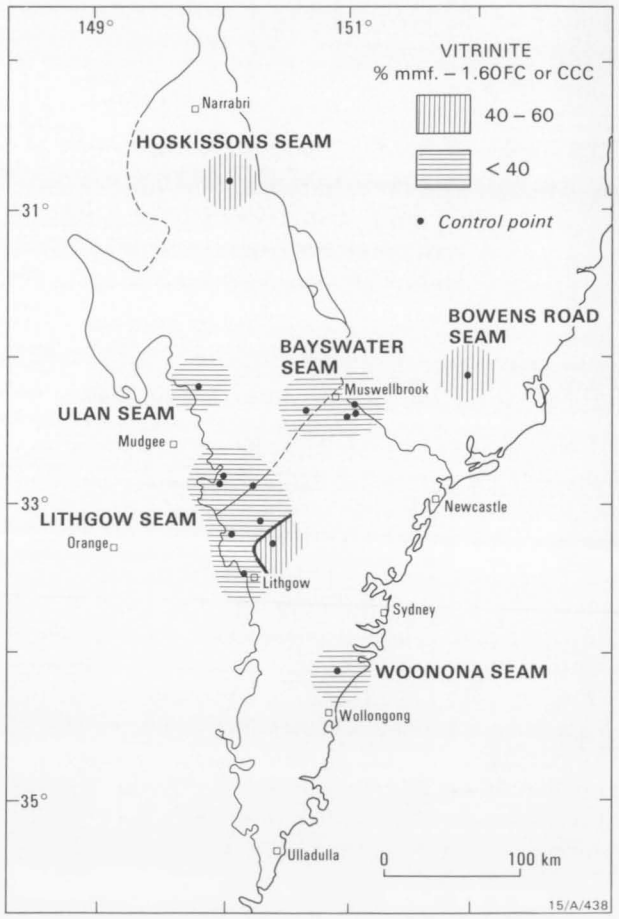


Fig. 19–23. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of lower part of upper coal measures Bayswater seams sequence in the Sydney, Gunnedah and Gloucester Basins.

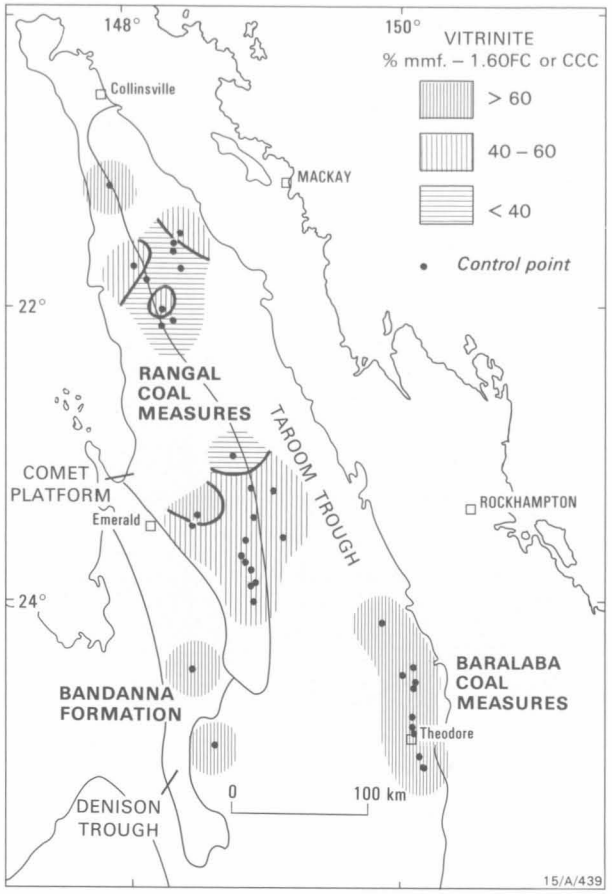


Fig. 19–24. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of top part of upper coal measures from the Bowen Basin.

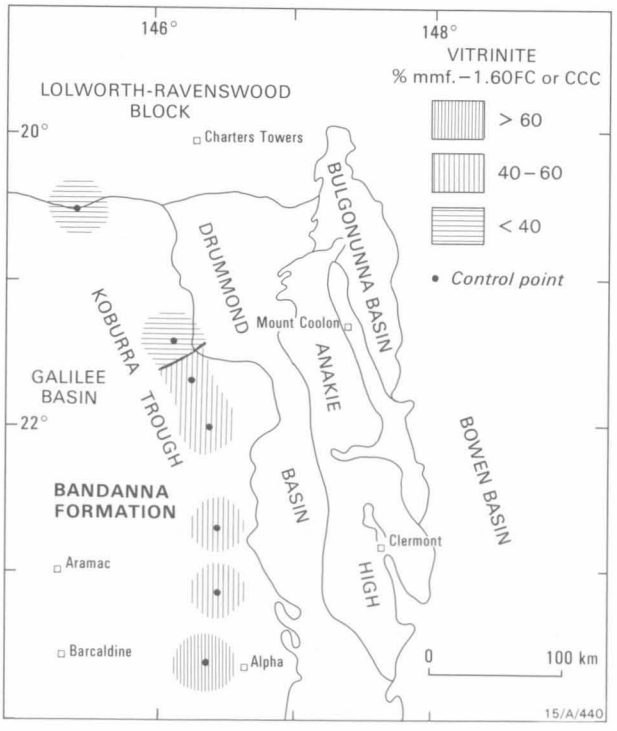


Fig. 19–25. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of top part of upper coal measures from the Galilee Basin.

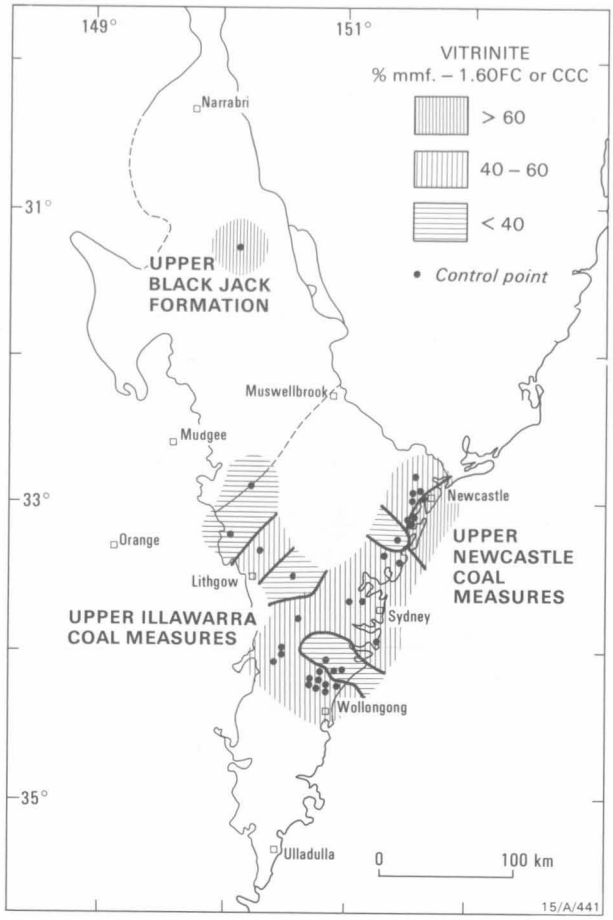


Fig. 19–26. Lateral variation in vitrinite content (% mmf–1.60FC or CCC) of Late Permian seams from the Sydney, and Gunnedah Basins.

Conclusions

Considerable variation is apparent when petrographic composition of the Permian coals is described in terms of vitrinite content, semifusinite ratio, and banding of the microlithotypes. In both the Early and Late Permian, the intracratonic basins contain predominantly inertinite-rich coals while the marginal basins have mainly vitrinite-rich coals. The small intracratonic Collie and Ashford Basins and coals in the southeast of the Galilee Basin are exceptions in this respect. Vitrinite content tends to decrease up sequence in the marginal basins, with the exception of the low-vitrinite Bayswater seam horizon towards the base of the Late Permian units in the Sydney, Gunnedah and Gloucester Basins.

The intracratonic basins, excluding the Galilee, are characterised by finely to very finely banded coals with low to very low semifusinite ratios in the Early and Late Permian. In the marginal basins,

the semifusinite ratio increases from low to medium, in a south–north direction in the Early Permian. The semifusinite ratio is consistently medium to high in the Late Permian, with the exception of the Bayswater seam horizon where it is low. Fineness of banding varies considerably within and between the marginal basins in both the Early and Late Permian deposits. Possible geological factors, which may account for the described variations, are discussed in Chapter 24.

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CHAPTER 20

Sulphur in the Permian Coals

by
J.W. Hunt

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Introduction

The amount, forms, origin and geological control of sulphur in coal have been the subject of intensive research over the last 30 years, because of the sulphur-related problems in coal utilization — particularly of high sulphur coals [>1% (daf) total sulphur]. These problems include the formation of mineral precipitation and corrosion of boiler tubes, difficulties in coal preparation, spontaneous combustion of coal in mines and stockpiles, deleterious effects of sulphur in metallurgical coke, and coal-derived liquid fuels, air and water pollution by sulphur compounds produced from burning coal and during acid drainage from sulphurous coals.

In the course of the present project, a large amount of sulphur data for Australian Permian coals (Fig. 20–1) has been reviewed, including total-sulphur content, forms of sulphur, petrographic association of sulphur, and the relationship between sulphur in coal and depositional environment. The last point is discussed in Chapter 24.

Sources of Sulphur

The sulphur available for incorporation into peat consists of either sulphur originally organically bound within the parent plant material, or of water-soluble inorganic salts.

Organic sulphur

Organically bound sulphur is one of the elements essential for the metabolic function of plants, and ranges from 0.01 to 3.5% (dry weight–dw) depending on the type of plant and stage of

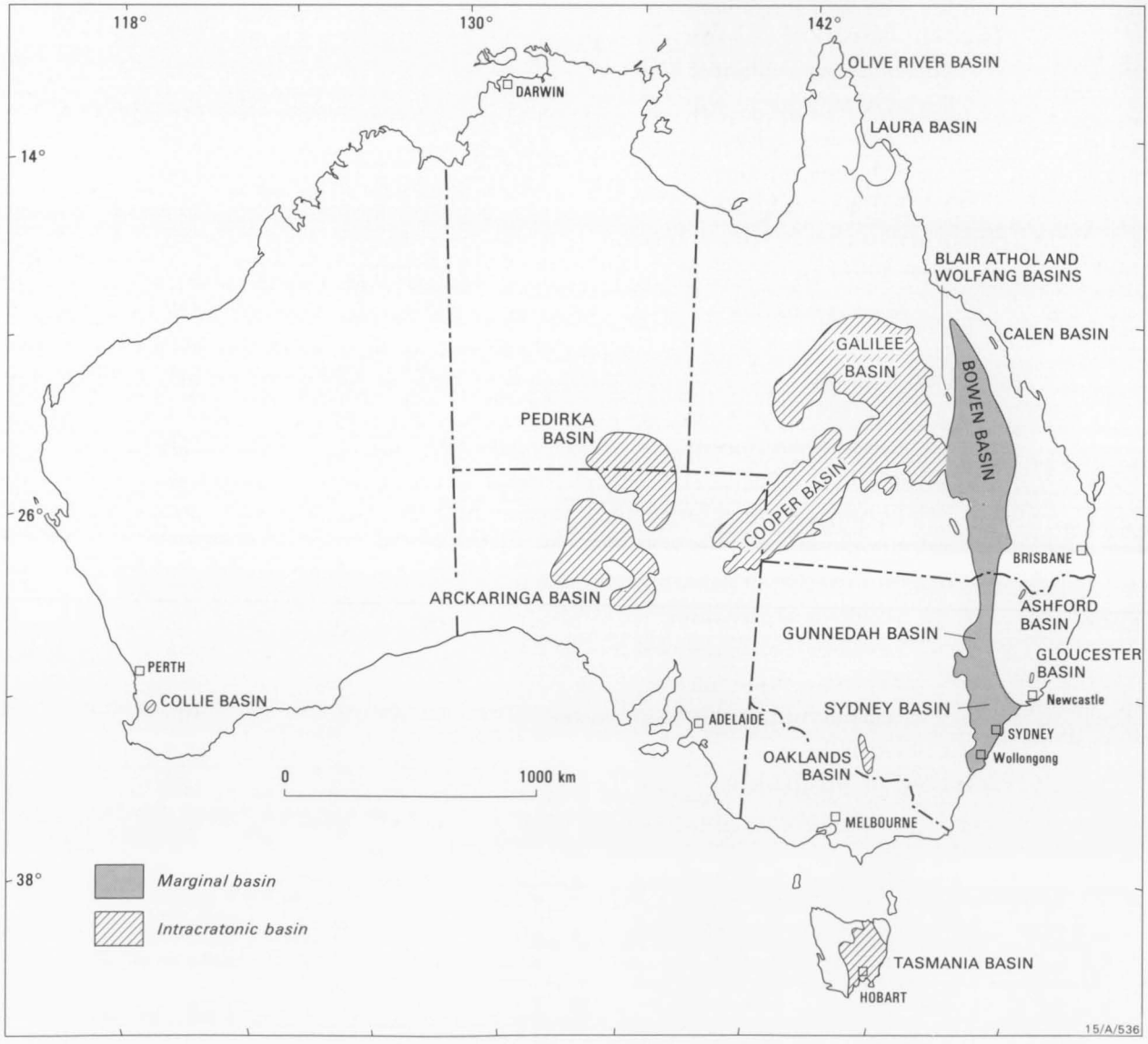


Fig. 20–1. Location of the Permian coal basins.

growth (Mektiyeva & others, 1976). It is found in proteins in protoplasm and seeds, in sulphohydrate and disulphide groups (Mektiyeva & others, 1976) and together with sulphur, derived from bacterial or rarely animal protein, is available for incorporation into peat. The lignocellulosic plant tissues, which are preferentially preserved in peat deposits, do not, however, contain organically bound sulphur in living plants according to Neavel (1966).

Sulphate sulphur

Water-soluble sulphate represents a major source of sulphur available for incorporation into living plants, and sulphate concentration would be expected in poorly drained marshy basins which are usually major sites of peat accumulation. The fresh-water sulphur pool has been estimated at 30 x 10^8t, compared with 50 x 10^8t in dead organic matter and 6 x 10^8t in land plants (Holser & Kaplan, 1966). Volcanic sulphur may also have made a local contribution to the terrestrial sulphate pool via SO_2 emission, and the estimated sulphur flux is equivalent to about 10% of the fresh-water sulphur pool (Granat & others, 1976). Sulphur in fresh water may also be derived from metamorphic and igneous rocks, evaporites or other sediments; the first two constituting 80% of the total sulphur pool.

The marine sulphur pool has been estimated at 1.3 x 10^{15}t, and incorporation of sulphate derived from overlying marine rocks into coal has been postulated by using sulphur isotope evidence (Smith & Batts, 1974).

Incorporation of Sulphur Into Peat

Micro-organisms play a dominant role in the cycling of sulphur, except during physicochemical evaporite formation and river transportation of sulphate. Present-day sulphur-reducing bacteria all belong to the genus *Desulfovibro* of the Microspira-type.

The biogenic origin of pyrite, particularly of the framboidal variety, is supported by its presence in vitrinite bands rather than in semifusinite cells, and by the common occurrence of uncompressed pyrite petrifications (Neavel, 1966). Subsequent metamorphic recrystallisation of syngenetic to late diagenetic biogenic pyrite to crystalline forms has occurred (Boctor & others, 1976).

Cleat and fracture-filling pyrite types are usually described as "secondary", formed by precipitation of iron and sulphate from percolating waters (several authors listed in Reyes-Navaroo & Davis, 1976). Neavel (1966) considers this thermodynamically unacceptable, because of the impossibility of concomitant transportation of both iron and sulphur compounds, and assumes the sulphide migrated from within the seam while the iron came from the overlying sediments. On the basis of sulphur isotope data, Smith & Batts (1974) have proposed that concentrations of pyrites in the upper part of the Greta and Pelton seams were derived from a marine sulphate source, which they assumed penetrated the iron-rich organic material.

Organically bound sulphur, the product of plant growth, is released as H_2S during decomposition and either escapes to the atmosphere or combines with metal ions to form sulphides (Thiessen, 1945). As the lignocellulosic tissues preserved during peat formation do not have sulphur in live plants, Neavel (1966) proposed that organically bound sulphur in coals is simply derived from sulphide ions, via freshwater sulphate. Cassagrande & Ng (1979) demonstrated that H_2S and elemental S can react with organic matter to form organically bound sulphur in peat.

Total Sulphur Content of Coal

In this chapter, total sulphur content is referred to as low (<0.55% daf), medium (0.55–1.0% daf) and high (> 1.0% daf), with reference to 1.60 relative density float fraction composites (1.60FC) or clean coal composites (CCC, i.e., the composites excluding discrete mineral matter bands >5 to 10 mm thick). The classes represent convenient groupings of the data, with respect to a proposed relationship with depositional environment, discussed in Chapter 24.

Sulphur content is calculated to a dry ash free basis (daf), because varying amounts of moisture and mineral matter irregularly "dilutes" the sulphur, which is mainly organically bound and obscures trends in sulphur content. A small error is introduced by reporting sulphur on a daf basis for coals with <1% sulphur, because of inorganic sulphur compounds which usually account for 20 to 40% of the total sulphur. For rarer high-sulphur coals (>1% daf), a dry, "ash-excluding pyrite"-free basis would be more precise. However, for the purpose of description, the discrepancy introduced by calculating the high-sulphur coals to a daf basis is not significant.

Total sulphur content for Australian Permian coals commonly varies between 0.3 and 1.0% (daf), although seams with up to 14% sulphur are known in areas of marine influence (e.g., Greta and Collinsville Coal Measures). Sulphur contents up to about 10% (dw) have been recorded for peats and coals (Casagrande & others, 1976; Kreulen, 1952) from other countries.

Within coal seams, sulphur may vary between subsections, particularly for medium to high-sulphur coals, principally owing to variation in the distribution of inorganically bound sulphur (Headlee & Hoskins, 1955; Mansfield, 1965).

For medium to high-sulphur coals, total sulphur content of the raw coal composites (RCC) is about 10% greater than for 1.60FC's or CCC's samples, because of the higher pyrite content of the raw coal. Total sulphur content of a geographically constrained and, in some cases, duplicate set of RCC's and 1.60FC's of the medium to high-sulphur coals in the German Creek Formation is shown in Fig. 20–2a.

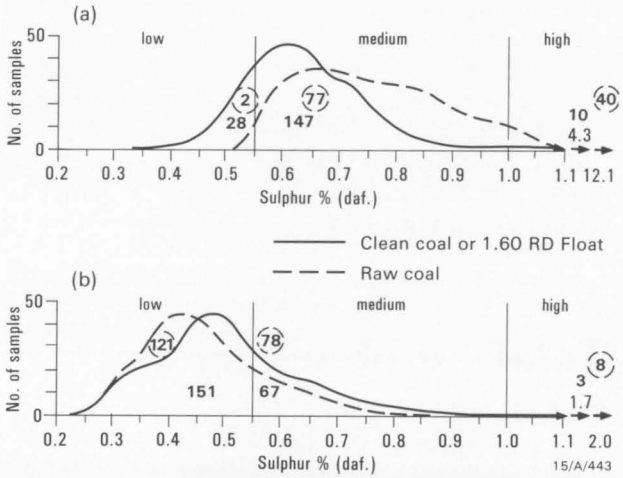


Fig. 20–2a. Sulphur content (% daf) of raw coal composites and 1.60 relative density float fraction composites of seams in the German Creek Formation from the Bowen Basin.

Fig. 20–2b. Sulphur content (% daf) of raw coal composites (RCC) and 1.60 relative density float fraction composites (1.60-FC) of seams in the Rangal Coal Measures from the Bowen Basin.

For low-sulphur coals, the difference between the sulphur content of the RCC's and 1.60FC's or CCC's is minimal. Total sulphur content of a geographically constrained and, in some cases duplicate, set of RCC's and 1.60FC's from generally low-sulphur coals in the Rangal Coal Measures, is shown in Fig. 20–2b. The washed coals have marginally more sulphur, because the sulphur is mainly organically bound (<80%), and removal of mineral matter (including a small amount of pyrite) results in an apparent increase in the concentration of total sulphur.

Forms of Sulphur in Coal

Sulphur in coals is found mainly in organic combination or as sulphide minerals. Small amounts of sulphate minerals or elemental sulphur may also be present, although the latter has not been determined for the coals discussed and is included in the organic sulphur category, as determined by difference [i.e., total sulphur minus (pyritic + sulphate) sulphur = organic sulphur].

Organic sulphur

Organically bound sulphur is present probably as thioethers, thiophenols and disulphide groups (Brooks, 1956), and Casagrande & others (1980) found that 40% of the organic sulphur in a recent peat was bound to amino acids (cystine, cysteine, methionine, methionine sulfone and sulfoxide, tuarine and cysteic acid). Organic sulphur usually constitutes between 50 and 90% of total sulphur, but organic sulphur between 3 and 11% are occassionally reported (Kreulen, 1952; Rafter, 1962; Brooks, 1956).

Neavel (1966, in Reyes-Navarro & Davis, 1976), who studied the vertical and laterial distribution of sulphur in coal, found that: (i) the vitrinite macerals contain more sulphur than the inertinite macerals; (ii) there is no gradient from edge to centre for organic sulphur; (iii) there is no difference in the organic sulphur content of matrix vitrinite (desmocollinite) or band vitrinite (telocollinite + telinite); and (iv) organic sulphur content in vitrinite does not change in vitrinite-rich layers in contrast to inertinite-rich layers.

Sulphide sulphur

Sulphur combined inorganically as metal sulphides is most commonly present as pyrite, or less so as marcasite, sphalerite, galena, chalcopyrite or arsenopyrite (Kemezys & Taylor, 1964), and rarely as millerite.

Sphalerite (ZnS) occurs in trace amounts as isolated anhedral grains to 100 μm diameter in coal and clay layers, as veins to 20 μm width or filling cells in semifusinite.

Galena (PbS) is comparatively rare and is found mainly as veins or filling semifusinite cells.

Chalcopyrite ($CuFeS_2$) is very rare and occurs in association with pyrite, sphalerite and galena.

Marcasite (FeS_2) is similar to pyrite in its habit and mode of occurrence (Boctor & others, 1976). Cook & Read (1969) have observed marcasite replacing organic cell-filling material in the southern Sydney Basin.

Millerite (NiS), probably of secondary origin, was reported in a Permian coal from the Sydney Basin by Lawrence & others (1960).

Pyrite (FeS_2) is found particularly in vitrite and clay layers and may occur as (i) single cubes or pyritohedra, mainly <1μm but ranging to 100μm in width, sometimes replacing siderite (Smyth,

1966); (ii) framboids consisting of finely disseminated irregular to spherical nodules, mainly from 20 to 50μm in width (Balme, 1956); (iii) aggregates of crystals or framboids from a few microns to a few tens of microns in width (Greer, 1978); (iv) horizontal or vertical massive forms to several centimeters in thickness, filling fractures, dessication cracks or cleat, with a texture of anhedral interlocking grains, or rarely acicular radiating crystals or nodules to 2 μm across (Kemezys & Taylor, 1964); and (v) cell-filling material in vitrinite or semifusinite.

Pyrite is irregularly distributed throughout seam sections, but in high-sulphur seams is often concentrated at the upper seam margin.

Sulphate sulphur

Sulphate is present usually as gypsum ($CaSO_4.2H_20$) and occasionally as barite ($BaSO_4$) (Kemezys & Taylor, 1964) or melanterite ($FeSO_4.7H_2O$) (Kossenberg & Cook, 1961). Sulphate sulphur usually indicates oxidation of the coal; the sulphate being produced by oxidation of sulphides and interaction with other minerals.

Gypsum may be found in large amounts as veins, related to present-day arid climates, e.g., Arckaringa Basin (Taylor, 1977).

Barite may be present, depending on Ba being residual in the substrate; and a 1 cm-thick vein of prismatic, columnar to anhedral crystals has been recorded in the base of the Taurus seam from the Rangal Coal Measures of the Bowen Basin (Kemezys & Taylor, 1964).

Sulphur in the Permian Basins

In the following section, sulphur content and forms of sulphur for the Australian Permian coals are reviewed by age and basin. Table 20–1 lists the age and range of major Permian coal-bearing sequences.

Sulphur content of the coal measures is shown in histograms. In most instances, the sulphur data is related to thicker (>1 m) "economic" seams sampled, and some spread of data would be expected because of laboratory tolerances within (0.05% db) and between (0.10% db).

Early Permian

Marginal basins

Bowen Basin. The Bowen Basin has Early Permian coal measures at two horizons. The lower coal-bearing sequence in the Reids Dome beds originated early in the Early Permian and the upper coal-bearing sequence, which includes the Collinsville Coal Measures and equivalents in the Back Creek Group, late in the Early Permian.

Coals from the Reids Dome beds in Taroom 11/11A have medium sulphur contents and in AAO Westgrove 1 and 2 low sulphur amounts (Fig. 20–3a). Sulphur content in the Collinsville Coal Measures is generally medium to high, and several seams have 14% sulphur (daf) (Fig. 20–3b), probably because of access to marine sulphate (Smith & Batts, 1974). Pyritic sulphur constitutes about 40 to 50% of total sulphur for medium-sulphur coals (Fig. 20–6). Collinsville Coal Measure equivalents near Rugby to the south have between 2.1 to 2.6% (daf) sulphur (9 samples in Davis, 1970).

South and northeast of the intracratonic Blair Athol and Wolfang Basins, coals in the Aldebaran Sandstone and Back Creek Group are medium to high in sulphur (Fig. 20–3c).

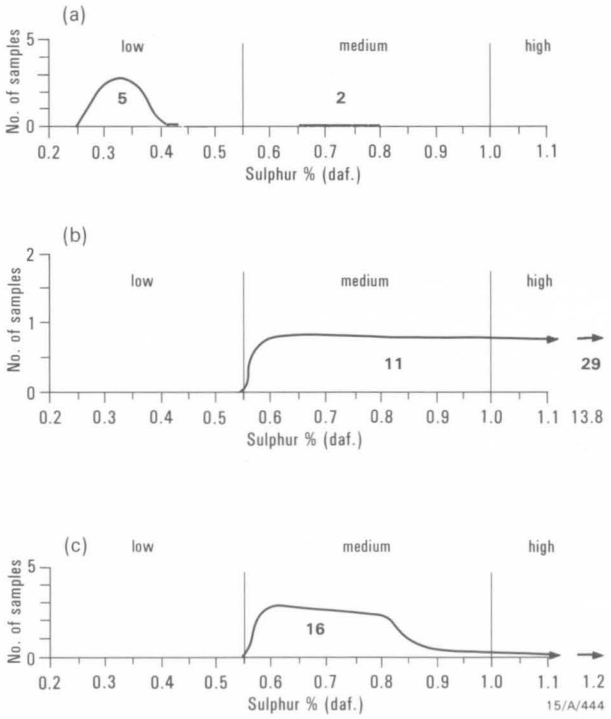


Fig. 20–3a. Total sulphur content (% daf–RCS or CCC) of seams in the Early Permian Reids Dome beds from the Bowen Basin.

Fig. 20–3b. Total sulphur content (% daf–1.60FC and CCC) of seams in the Early Permian Collinsville Coal Measures from the Bowen Basin.

Fig. 20–3c. Total sulphur content (% daf–1.60FC and CCC) of seams in the Early Permian Aldebaran Sandstone from the Bowen Basin.

Gunnedah Basin. Limited data are available for Early Permian coals in the Leard and Maules Creek Formations of the Gunnedah Basin. Sulphur content of coals from the Maules Creek Formation in the northeast is low (Fig. 20–4a) and pyritic sulphur is less than 10% of total sulphur (Fig. 20–6).

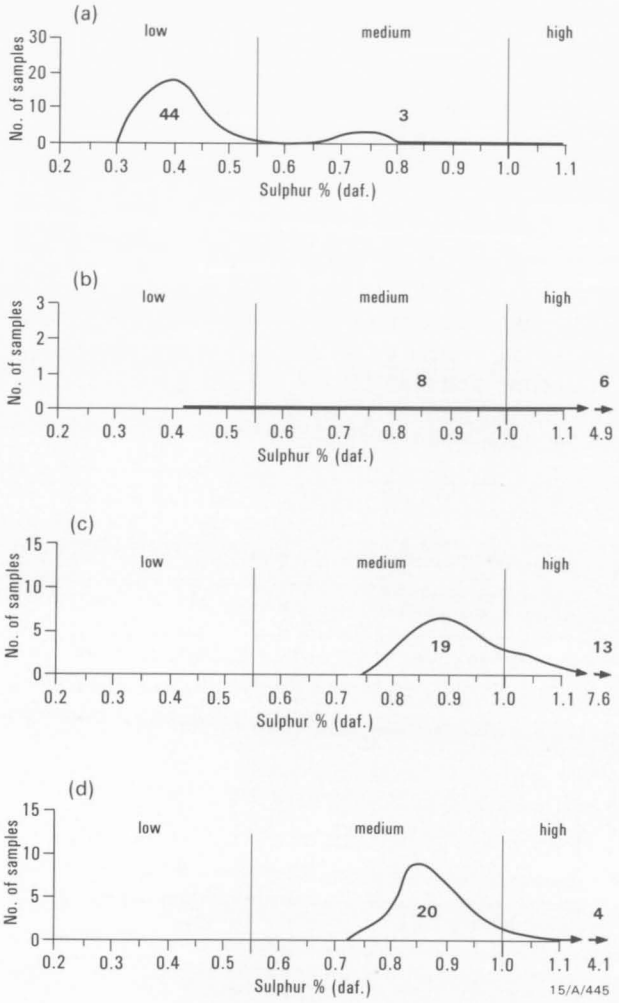


Fig. 20–4a. **Total sulphur content (% daf–1.60FC) of seams in the Early Permian Maules Creek Formation from the northeastern Gunnedah Basin.**

Fig. 20–4b. **Total sulphur content (% daf–RCC and 1.60FC) of seams in the Early Permian Leard Formation from the southwest and southern Gunnedah Basin.**

Fig. 20–4c. **Total sulphur content (% daf–CCC and 1.60FC) of seams in the Early Permian Greta Coal Measures from the Cessnock area in the northeastern Sydney Basin.**

Fig. 20–4d. **Total sulphur content (% daf–CCC or 1.60FC) of seams in the Early Permian Greta Coal Measures from the Muswellbrook area in the northeastern Sydney Basin.**

Medium to high-sulphur coals are found in the underlying Leard Formation in DM Maules Creek DDH5 (Fig. 20–4b), and medium-sulphur coals occur sometimes in the top seam of the Maules Creek Formation. Southwest of the Boggabri Ridge, a single high-sulphur seam is present in DMR Howes Hill DDH1 in a thin sequence equivalent to the Leard and Maules Creek Formations. A single seam mined at Werris Creek in the south of the Gunnedah Basin has a sulphur content of about 0.3% (daf) (Britten & Hanlon, 1975). Farther south at Wingen, Early Permian coals are low in sulphur except for the upper seam.

Sydney Basin. Sulphur data are available for the Early Permian Greta Coal Measures at Cessnock, Muswellbrook and Glendonbrook in the north and northeast of the Sydney Basin and the Clyde Coal Measures in the south. Sulphur content for most of the coal seams in the Greta Coal Measures at Cessnock is medium to high (Fig. 20–4c). The upper seam in the sequence is well known for its "brassy tops" with sulphur up to 7.6% (daf), comprising mainly pyritic sulphur. This sulphur is isotopically distinctive and probably formed by reduction of sea-water sulphate (Smith & Batts, 1974).

Greta Coal Measures are present in a small outlying Basin (Cranky Corner Basin) north of Cessnock, where the Tangorin seam has 6.3% (daf) sulphur. Sulphur content of coals in the Greta Coal Measures in the Muswellbrook and Balmoral areas is medium to high for most seams (Fig. 20–4d); pyritic sulphur is between 0 and 40% of total sulphur (Fig. 20–6). Greta Coal Measure equivalents of the Loder Dome and East Maitland petroleum bores also show medium to high sulphur contents (Fig. 20–18). Sulphur in a single seam from the Clyde Coal Measures from the south of the basin was high at 1.2% (daf) (Cook & Read, 1968).

Intracratonic basins

Blair Athol and Wolfang Basins. The thick basal seam of the Blair Athol Coal Measures at Blair Athol and Wolfang is low in sulphur (Figs 20–5a and 5b). A few thin seams in the top of the sequence at Wolfang contain 0.68 to 0.77% (daf) sulphur pyritic; sulphur accounts for between 10 and 60% of total sulphur (Fig. 20–6).

Ashford Basin. The Ashford Coal Measures are located within the orogenic New England Fold Belt east of the Gunnedah Basin and north of the Sydney Basin. Sulphur content in the Ashford seam is low (Fig. 20–5c), and pyritic sulphur is about 20 to 25% of total sulphur (Fig. 20–6).

Cooper Basin. Early Permian coal measures in the Cooper Basin are found mainly within the Patchawarra Formation. Limited analytical data suggest that sulphur content is low to medium, which is in accord with the rarity of pyrites.

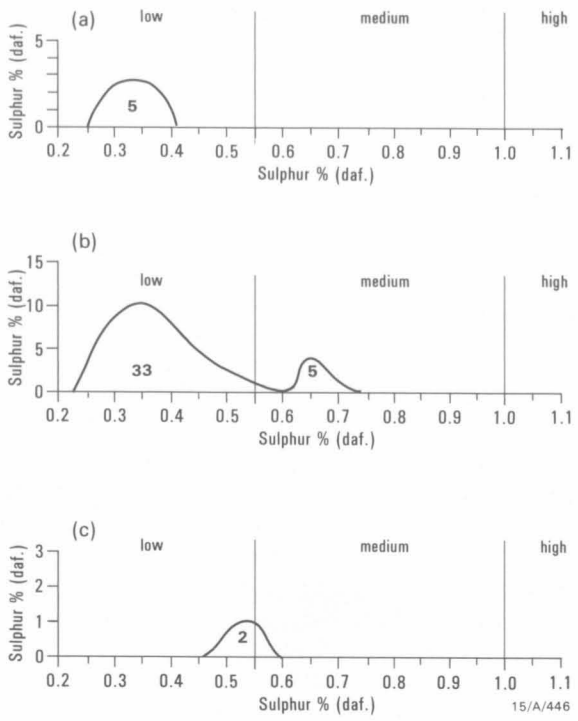


Fig. 20–5a. **Total sulphur content (% daf–CCC) of the Big seam in the Early Permian Blair Athol Coal Measures from the Blair Athol Basin.**

Fig. 20–5b. **Total sulphur content (% daf–CCC) of the seams in the Early Permian Blair Athol Coal Measures from the Wolfang Basin.**

Fig. 20–5c. **Total sulphur content (% daf–CCC or 1.60FC)) of the Ashford seam in the Early Permian Ashford Coal Measures from the Ashford Basin.**

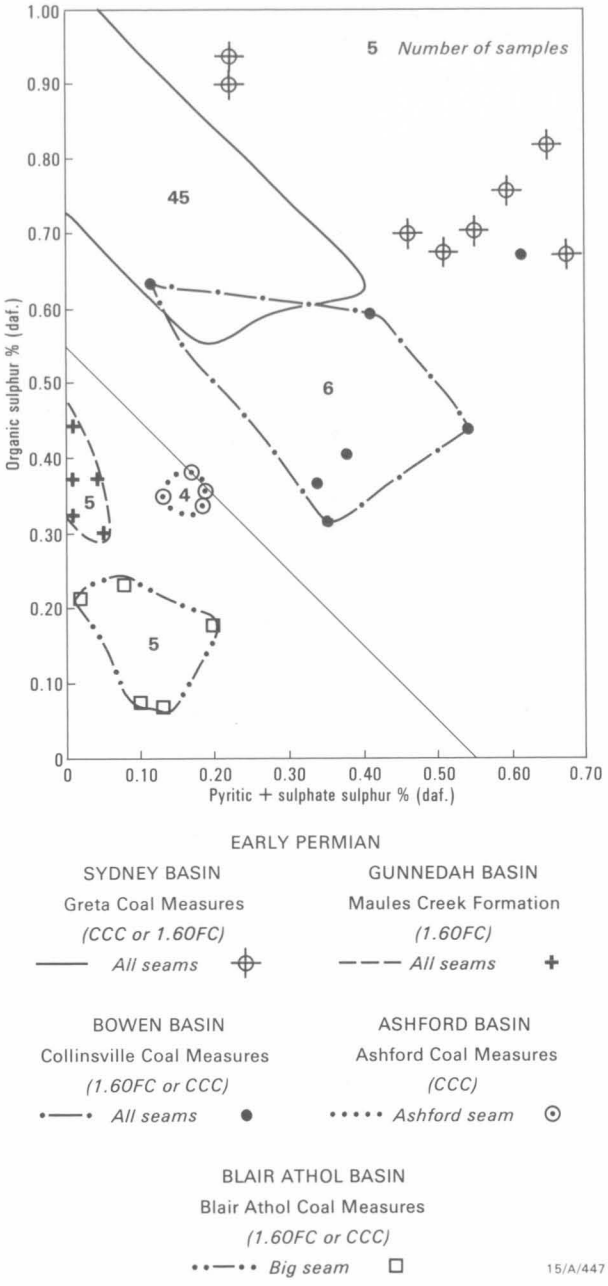


Fig. 20–6. **Forms of sulphur (% daf–CCC or 1.60FC)) in seams from the Early Permian Collinsville, Blair Athol, Ashford and Greta Coal Measures and the Maules Creek Formation.**

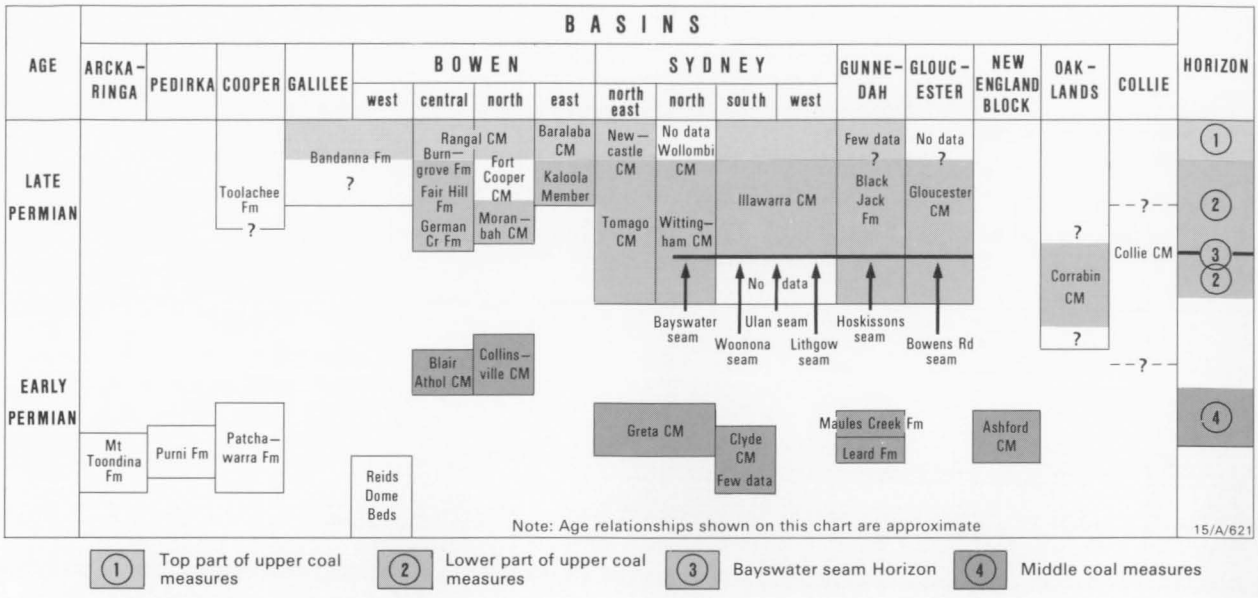
Arckaringa Basin. The Arckaringa Basin is an intracratonic Permian basin with coals in the Mt Toondina Formation. Sulphur content is high (1.1% daf) for a single seam, excluding sulphate sulphur which is unusually high and probably of secondary origin (Taylor, 1977).

Late Permian

Marginal basins

Bowen Basin. Economic coal facies were developed in the Bowen Basin, both early and late in the Late Permian, and although the intervening strata are coal-bearing, the frequency and thickness of tuff bands throughout has precluded the coals from consideration as economic deposits. The early Late Permian German Creek Formation is overlain by the marine Macmillan Formation, which interfingers with the partly laterally equivalent Moranbah Coal Measures. They, in terms, are overlain by the uneconomically coal-bearing Fair Hill and Burngrove Formations or Fort Cooper Coal Measures through most of the basin. Later in the Late Permian, economic coal facies were developed throughout the basin. They are the Rangal Coal Measures in the north and south, the Baralaba Coal Measures in the south-east, and the Bandanna Formation in the west (Table 20–1).

TABLE 20–1. SIMPLIFIED CORRELATION CHART FOR THE PERMIAN COAL BASINS, SHOWING HORIZONS USED FOR PALAEOGEOGRAPHIC RECONSTRUCTIONS



Sulphur content in the German Creek Formation is medium to high in the south (Fig. 20–7a), decreasing to the north. Sulphur content for the raw coal sections is generally higher and many raw coal analyses include sulphur between 1 and 5% (daf), owing to increased pyritic sulphur. Pyritic sulphur forms between 10 and 80% of total sulphur (Fig. 20–8).

Sulphur content of the Moranbah Coal Measures is medium from Norwich Park to Moranbah, and low to medium (Fig. 20–7b) from Goonyella to Newlands. Farther north at Havilah, sulphur content is still low to medium, based on the few analyses available. Pyritic sulphur is only 10% of total sulphur in the 1.60FC analyses available (Fig. 20–8).

Sulphur content is medium for most seams in the Fair Hill Formation from Emerald NS2 (Fig. 20–7c) reaching 1.7% (daf) for the lower ply of the Fair Hill seam. Pyritic sulphur is up to 20% of total sulphur for the 1.60FC samples, excluding the lower ply of the Fair Hill seam, where it is dominant (Fig. 20–8).

Sulphur content in the Burngrove Formation is medium to high (Fig. 20–9a) with organic sulphur dominant in the 1.60FC's. Sulphur content in the Rangal Coal Measures is low to medium (Fig. 20–9b), with the medium values more common towards the centre of the basin, where pyritic sulphur is also more prominent (Bluff in Fig. 29–10).

The basal Kaloola Member of the Baralaba Coal Measures shows a medium sulphur content, with up to 50% pyritic sulphur (Fig. 20–9). Sulphur content in the Baralaba Coal Measures is low to medium, (Fig. 20–8c) and total sulphur increases northward. Organic sulphur predominates in the low-sulphur coals, with variable pyritic sulphur contents in the medium-sulphur coals (Fig. 20–10).

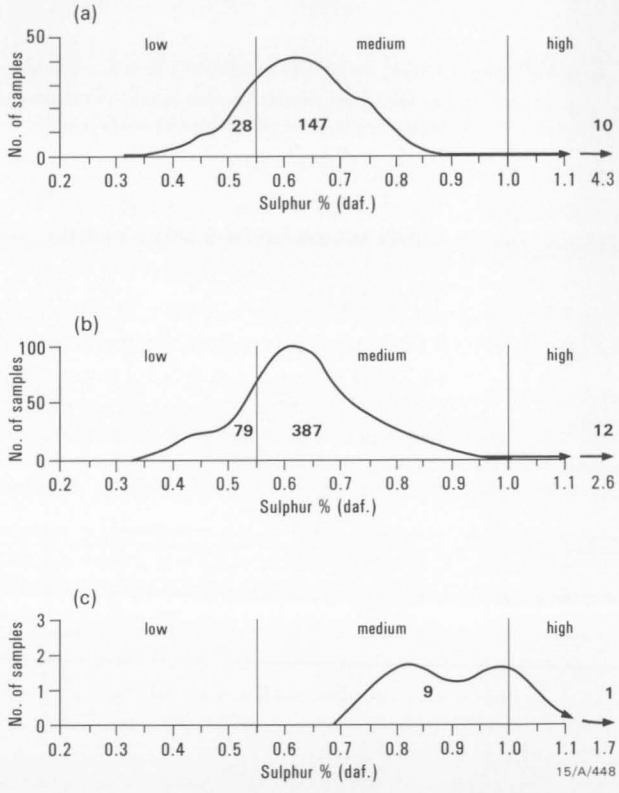


Fig. 20–7a. Total sulphur content (% daf–1.60FC or CCC) of seams in the Late Permian German Creek Formation from the central Bowen Basin.

Fig. 20–7b. Total sulphur content (% daf–1.60FC or CCC) of seams in the Late Permian Moranbah Coal Measures from the northern Bowen Basin.

Fig. 20–7c. Total sulphur content (% daf–1.60FC) of seams in the Late Permian Fair Hill Formation in Emerald NS2 from the central Bowen Basin.

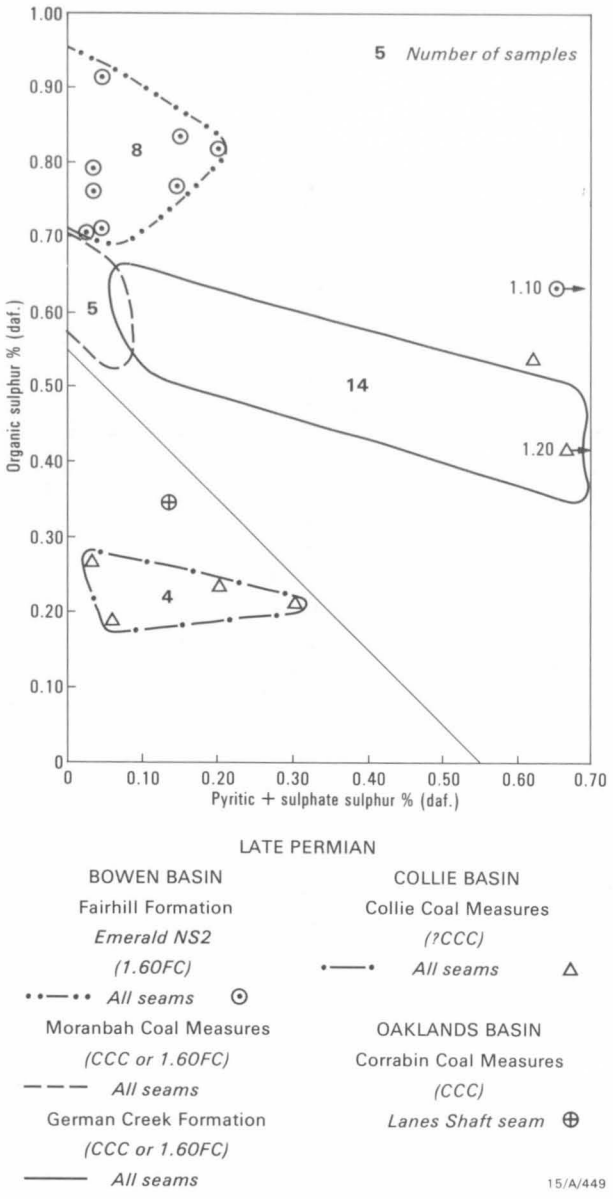


Fig. 20–8. Forms of sulphur (% daf–CCC and 1.60FC in seams from the Late Permian German Creek and Fairhill Formations and the Moranbah, Corrabin and Collie Coal Measures.

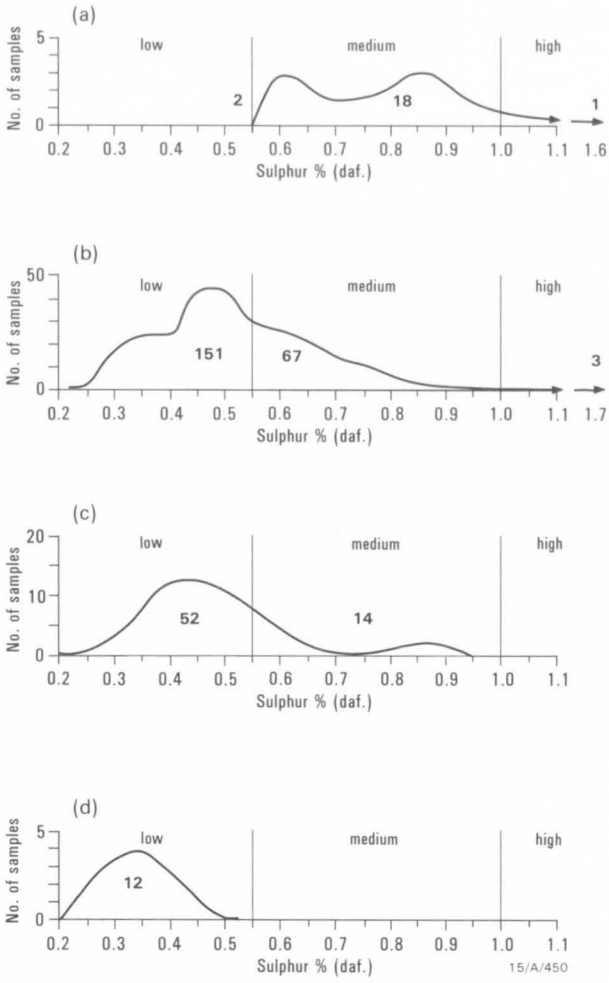


Fig. 20–9a. Total sulphur content (% daf–CCC or 1.60FC) of seams in the Late Permian Burngrove Formation from the northern and central Bowen Basin.

Fig. 20–9b. Total sulphur content (% daf–CCC or 1.60FC) of seams in the Late Permian Rangal Coal Measures from the northern and central Bowen Basin.

Fig. 20–9c. Total sulphur content (% daf–CCC or 1.60FC) of seams in the Late Permian Baralaba Coal Measures from the southeastern Bowen Basin.

Fig. 20–9d. Total sulphur content (% daf–1.60FC) of seams in the Late Permian Bandanna Formation from the western Bowen Basin.

Sulphur content for seams from the Bandanna Formation in the southeast is low to medium at Consuelo (Fig. 20–9d), although analysis of a single seam on the Springsure Shelf showed 4.3% (daf) sulphur (Anderson, 1974).

Gunnedah Basin. A limited amount of analytical data is available for seams of the Late Permian Black Jack Formation in the Gunnedah Basin. The lower seams of the Black Jack Formation have medium to high sulphur contents (Fig. 20–11a). The overlying Hoskissons seam has a mainly low sulphur content (Fig. 20–13a) in the east of the basin. The overlying seams have medium sulphur contents (included in Fig. 20–15a). However, the uppermost seam in the basin is generally high in sulphur.

Sydney Basin. Coal-bearing facies were deposited in the Sydney Basin throughout the Late Permian. In the northeast, around Newcastle, the Tomago and overlying Newcastle Coal Measures have mainly economic coal throughout, with the exception of a barren interval in the middle of the former and the tuff-banded coals in the middle of the latter. Correlatives in the Upper Hunter Valley

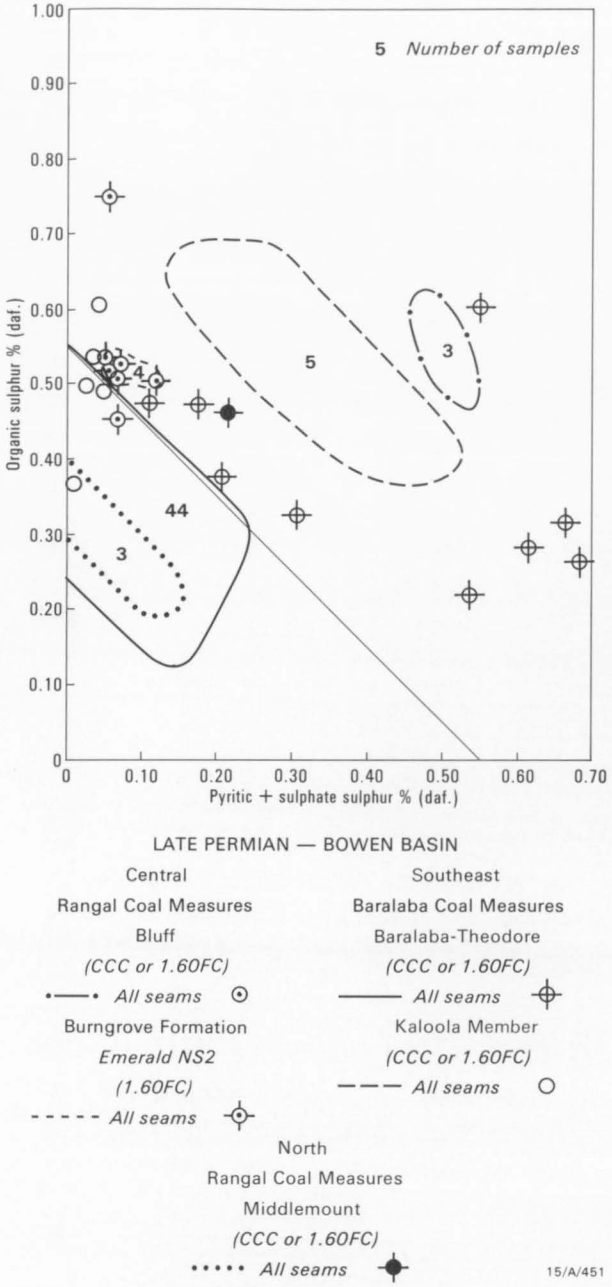


Fig. 20–10. Total sulphur (% daf–CCC or 1.60FC) in seams from the Late Permian Burngrove Formation and the Rangal and Baralaba Coal Measures.

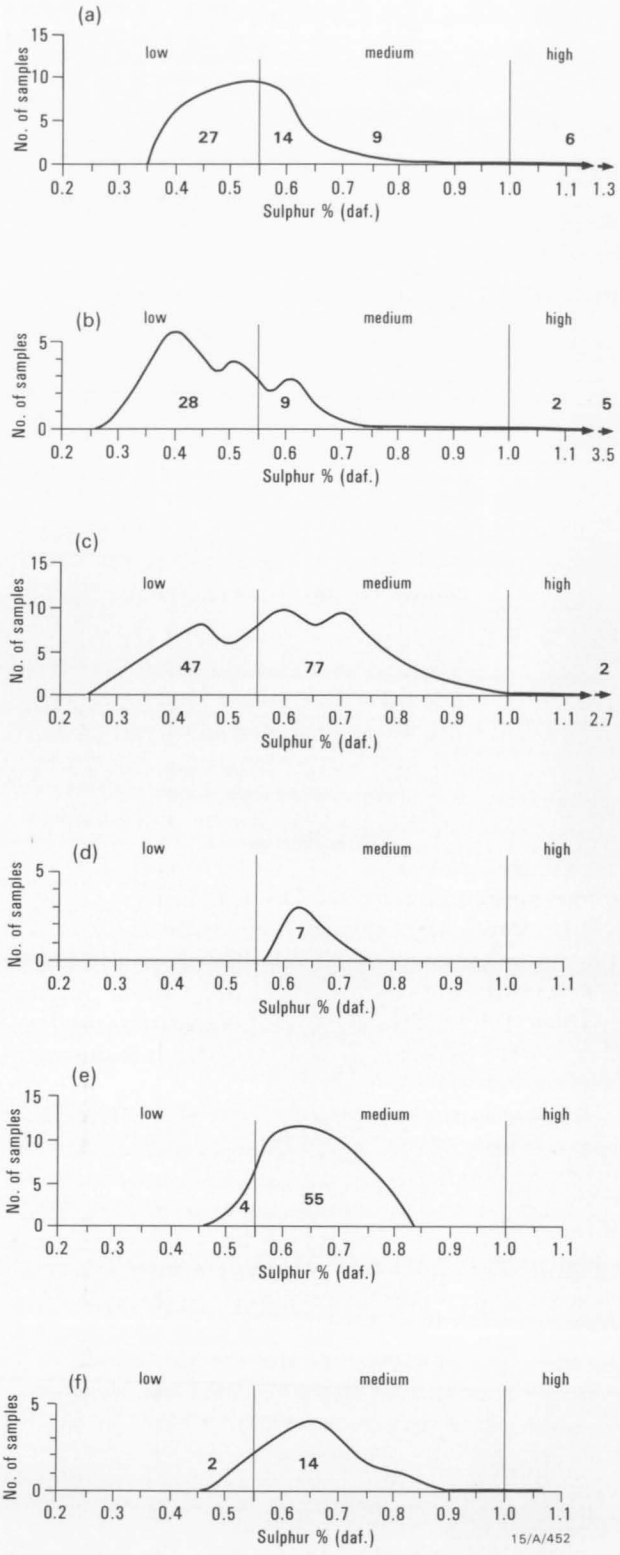


Fig. 20–11a. Total sulphur content (% daf–CCC or 1.60FC) of the lower seams in the Late Permian Black Jack Formation (excluding the Hoskissons seam) from the southwestern Gunnedah Basin.

Fig. 20–11b. Total sulphur content (% daf–CCC or 1.60FC) of the lower seams in the Late Permian Newcastle Coal

to the north are the Wittingham and overlying Wollombi Coal Measures, and the latter are often highly tuff-banded and uneconomic. In the south and west of the Sydney Basin, the Illawarra Coal Measures are correlatives of the northern sequences (Table 20–1).

Sulphur content for the Tomago Coal Measures is medium (Fig. 20–11b) with several analyses showing 2 to 4% (daf) sulfur. Organic sulphur predominates in the samples with medium sulphur contents (Fig. 20–12). Sulphur at the base of the

Measures and the Tomago Coal Measures from the northeastern Sydney Basin.

Fig. 20–11c. Total sulphur content (% daf–CCC or 1.60FC) of seams in the Late Permian Wittingham Coal Measures (excluding the Bayswater seam) from the northern Sydney Basin.

Fig. 20–11d. Total sulphur content (% daf–1.60FC) of seams in the Late Permian Wollombi Coal Measures from the northern Sydney Basin.

Fig. 20–11e. Total sulphur content (% daf–CCC or 1.60FC) of the lower seams in the Late Permian Illawarra Coal Measures (excluding the Lithgow and Woonona seams) from the southern and western Sydney Basin.

Fig. 20–11f. Total sulphur content (% daf–1.80FC) of seams in the Late Permian Gloucester Coal Measures (excluding the Bowens Road Seam) fro the Gloucester Basin.

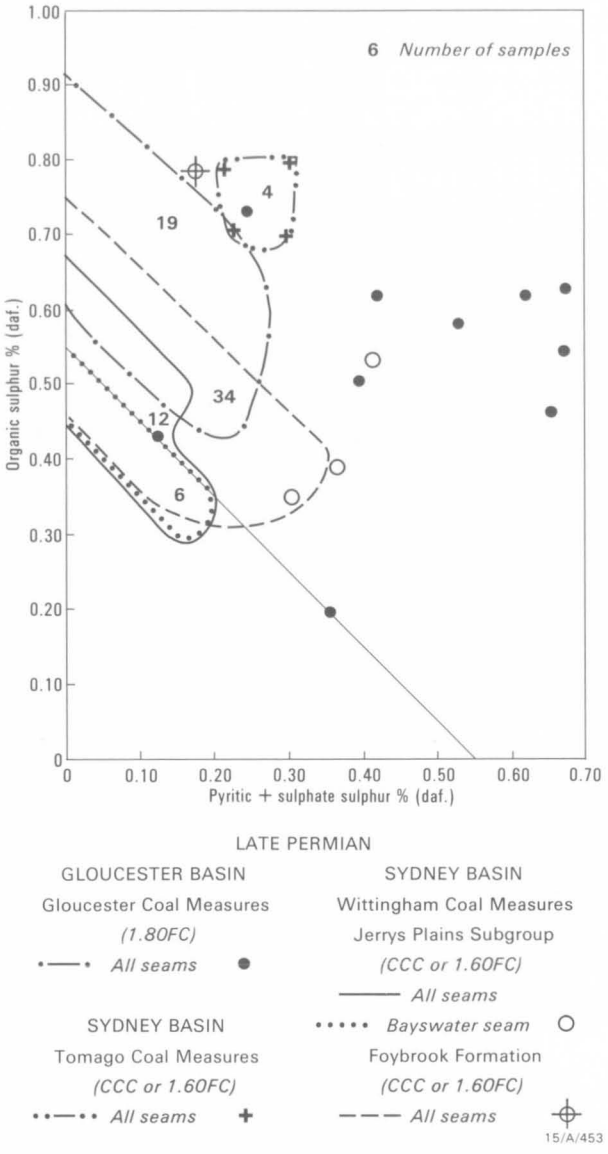


Fig. 20–12. Forms of sulphur (% daf–CCC or 1.60FC) in seams from the Late Permian Wittingham, Tomago and Gloucester Coal Measures.

Newcastle Coal Measures has an overall upward-decreasing trend from 0.60 to 0.30% (daf) (Fig. 20–11b) independent of coal type, with organic sulphur dominating (Fig. 20–14). The upper seams of the Newcastle Coal Measures are usually low in sulphur (Fig. 20–15b), with organic sulphur dominant (Fig. 20–14) and total sulphur decreasing up the sequence.

Sulphur content for seams in the lowermost coal-bearing unit of the Wittingham Coal Measures is medium for the upper and lower seams, and low for seams in the middle of the sequence (Fig. 20–11c); pyritic sulphur ranges from 0 to 50% of total sulphur (Fig. 20–12). Sulphur content in the overlying Bayswater seam is medium (Fig. 20–13b) towards the centre of the basin; decreasing to low towards the bounding Hunter Thrust Zone in the east. Most of the sulphur is organically combined (Fig. 20–12). Sulphur content in the remainder of the Jerrys Plains Subgroup is generally low to medium (Fig. 20–11c); here too with most of the sulphur is organically bound (Fig. 20–12).

The overlying Wollombi Coal Measures are poorly known, but the limited data available suggests that sulphur content is medium throughout the lower seams (Fig. 20–11c) and is low in an upper seam (1 sample).

Sulphur content in the Ulan and Lithgow seams from the Illawarra Coal Measures in the southern Sydney Basin is generally medium (Fig. 20–13c). The basal part of the overlying sequence contains medium-sulphur coals (Fig. 20–11e), while the upper part contains low-sulphur coals (Fig. 20–15c). The sulphur is mainly organically bound in the Illawarra Coal Measures (Fig. 20–16).

Gloucester Basin. Limited analytical data are available for coals from the Gloucester Basin. Sulphur content for coals in the basal Dewrang Formation ranges from 1.1 to 2.3% (daf) (George, 1975). Sulphur contents for 1.80FC samples of the overlying seams are generally medium (Fig. 20–11f), with the sulphur mainly organically bound (Fig. 20–12). The Bowens Road seam, which may be a correlative of the Bayswater seam in the Sydney Basin (Table 20–1), is low to medium in sulphur (Fig. 20–13d).

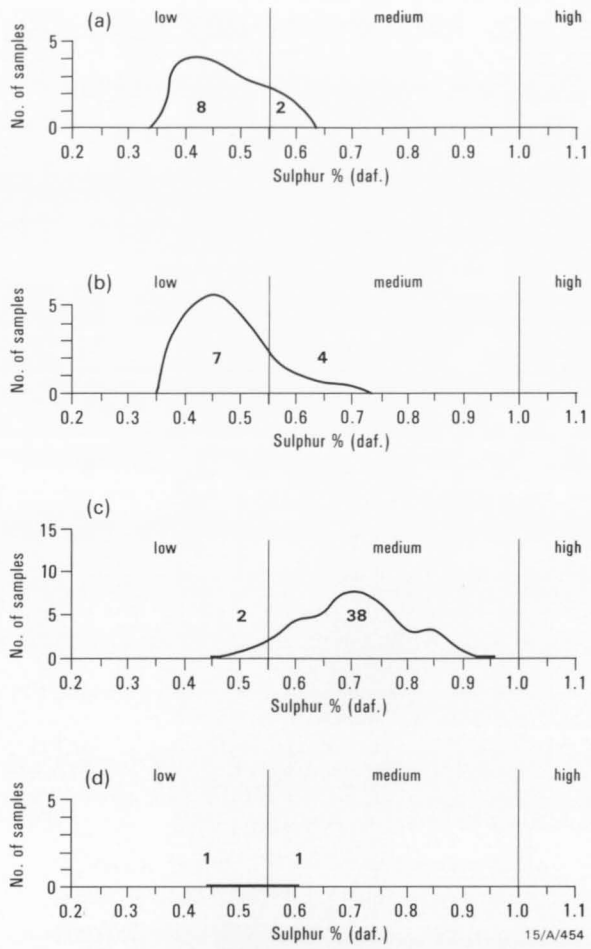


Fig. 20–13a. Total sulphur content (% daf–CCC or 1.60FC) of the Late Permian Hoskissons seam from the Gunnedah Basin.

Fig. 20–13b. Total sulphur content (% daf–CCC or 1.60FC) of the Late Permian Bayswater seam from the northern Sydney Basin.

Fig. 20–13c. Total sulphur content (% daf–CCC or 1.60FC) of the Late Permian Ulan, Lithgow, Lidsdale and Woonona seams from the southern and western Sydney Basin.

Fig. 20–13d. Total sulphur content (% daf–1.80FC) of the Late Permian Bowens Road seam from the Gloucester Basin.

Intracratonic basins

Galilee Basin. Sulphur content in the Galilee Basin is generally low in the north (Fig 20–17a) and is often highest in the basal seams; in the south, it is low to medium (Fig. 20–17b) and generally decreases up the sequence.

Oaklands Basin. The Coorabin Coal Measures in the top of the Oaklands Basin sequence has only a few seams (Driver, 1975). Sulphur content in the basal thick seam (Lanes Shaft seam) is low (Fig. 20–17c), and the sulphur is mainly organically bound (Fig. 20–8).

Collie Basin. Sulphur content for various seams from the Collie Coal Measures in the Collie Basin ranges from low to high (Fig. 20–17d), and is chiefly organically bound (Fig. 20–8).

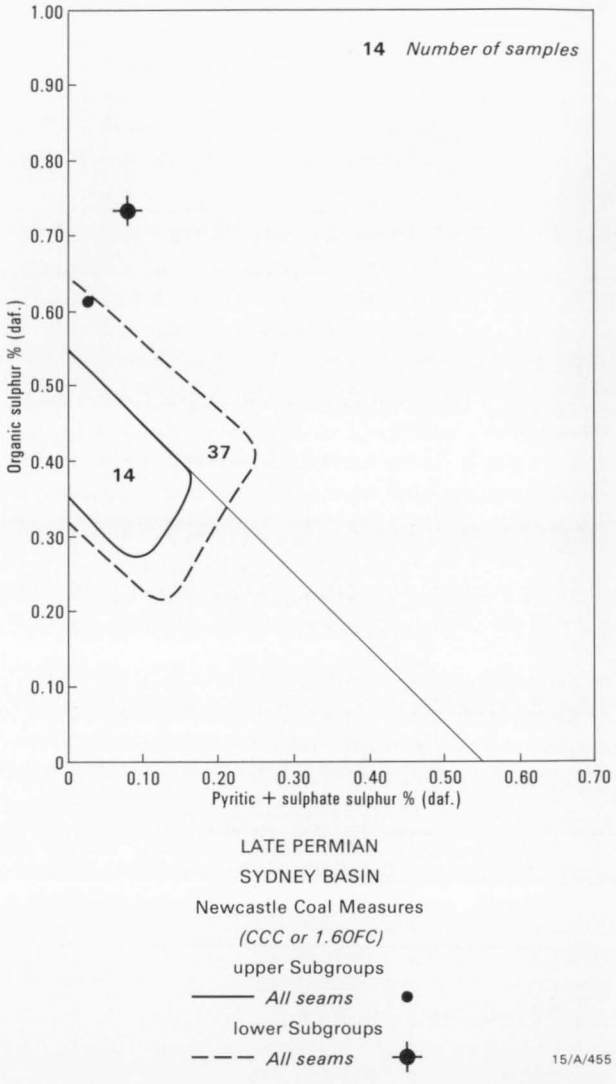


Fig. 20–14. Forms of sulphur (% daf CCC or 1.60FC) in seams from the Newcastle Coal Measures.

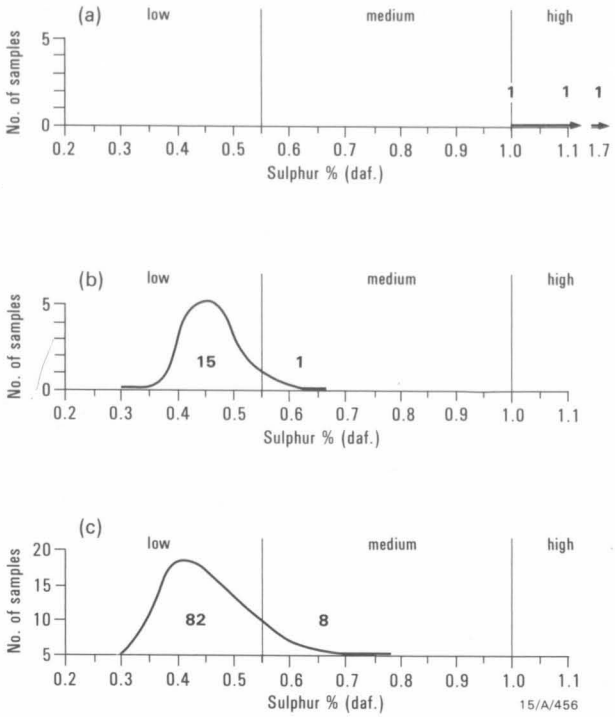


Fig. 20–15a. Total sulphur content (% daf–CCC or 1.60FC) of the upper seams in the Late Permian Black Jack Formation from the southwestern Gunnedah Basin.

Fig. 20–15b. Total sulphur content (% daf–CCC or 1.60FC) of the upper seams in the Late Permian Newcastle Coal Measures from the northeastern Gunnedah Basin.

Fig. 20–15c. Total sulphur content (% daf–CCC or 1.60FC) of the upper seams in the Late Permian Illawarra Coal Measures from the southern and western Sydney Basin.

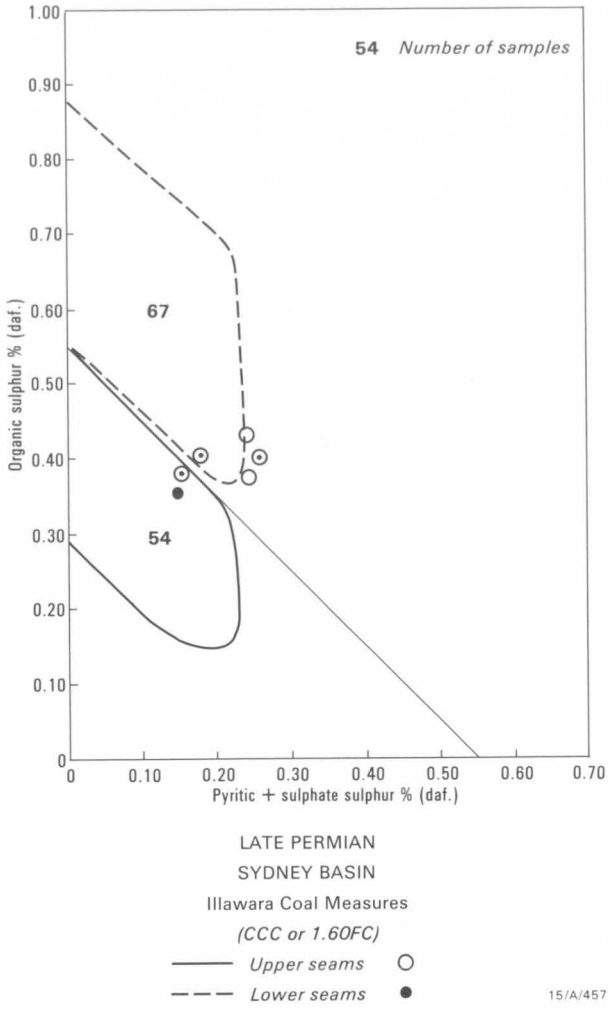


Fig. 20–16. Forms of sulphur (% daf–CCC or 1.60FC) in seams from the Late Permian Illawarra Coal Measures.

Discussion

Relationship Between Forms of Sulphur

Considering the relationship of the forms of sulphur, a clear distinction exists between high-sulphur coals (>1.0% daf) and low or medium-sulphur coals. Sulphur data for several suites of coals are shown in Fig. 20–18 for the Early Permian, and in Fig. 20–19 for the Late Permian. Although coals with more than 2% sulphur (daf) are not common, they are enriched in pyritic sulphur relative to organic sulphur, except for the Greta Coal Measures at Glendonbrook (Tangorin seam) and two seams sampled in the Loder Dome bore.

In high-sulphur coals, increase in total sulphur may be entirely due to increase in pyritic sulphur (e.g., Collinsville Coal Measures in Fig. 20–18), or some increase in organic sulphur can also take place (e.g., Greta Coal Measures in Fig. 20–18). Gluskoter & Simon (1968) show that the second case predominates in Illinois coals. Smith & Batts (1974) have demonstrated that distinct differences in enrichment trends of sulphur isotopes with seam depth exist between the Greta and Collinsville Coal Measures. They suggest on the basis of the isotope data that sulphide enrichment occurred in the Greta Coal Measures in the presence of excess sulphate during marine transgression soon after

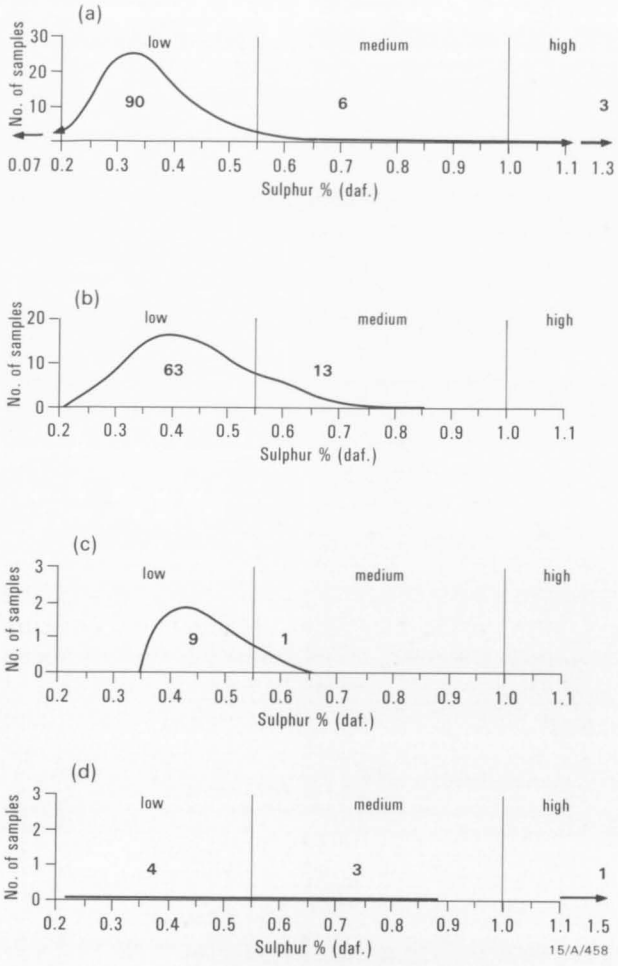


Fig. 20–17a. Total sulphur content (% daf–1.90FC + S) of seams in the Late Permian Bandanna Formation from the northeastern Galilee Basin.

Fig. 20–17b. Total sulphur content (% daf–1.90FC + S) of seams in the Late Permian Bandanna Formation from the southeastern Galilee Basin.

Fig. 20–17c. Total sulphur content (% daf–CCC or 1.60FC) of seams in the Late Permian Coorabin Coal Measures from the Oaklands Basin.

Fig. 20–17d. Total sulphur content (% daf–CCC or 1.60FC) of seams in the Late Permian Collie Coal Measures from the Collie Basin.

peat formation, leading to minor isotopic fractionation with depth. However, in the case of the Collinsville Coal Measures, small amounts of marine sulphate reached the peat some time after burial through several tens of metres of sediment, resulting in marked isotopic frationation with depth. The same conditions may also account for formation of a larger proportion of organically bound sulphur, where invasion by marine sulphate is early and in excess. Invasion, later during diagenesis, may have found the peat no longer reactive leading to deposition of mainly inorganically bound sulphur. For medium and low-sulphur coals, there is a trend for total sulphur in any particular seam to remain constant, with only the form of sulphur combination varying and with organic sulphur usually being dominant (Figs 20–6, 8, 10, 12, 14 and 16). In many instances, the low-sulphur coals have proportionally more pyritic sulphur than medium-sulphur coals.

The fact that total sulphur remains relatively constant implies that the seams were formed in a milieu with a limited, but constant, sulphate concentration. Sulphur-isotope composition of organic sulphur in low to medium-sulphur coals (Smith & others, 1982) suggests that incorporation of terrestrial sulphate during plant growth was the main source of sulphur. Variation in the proportion of organically and pyritically bound sulphur in

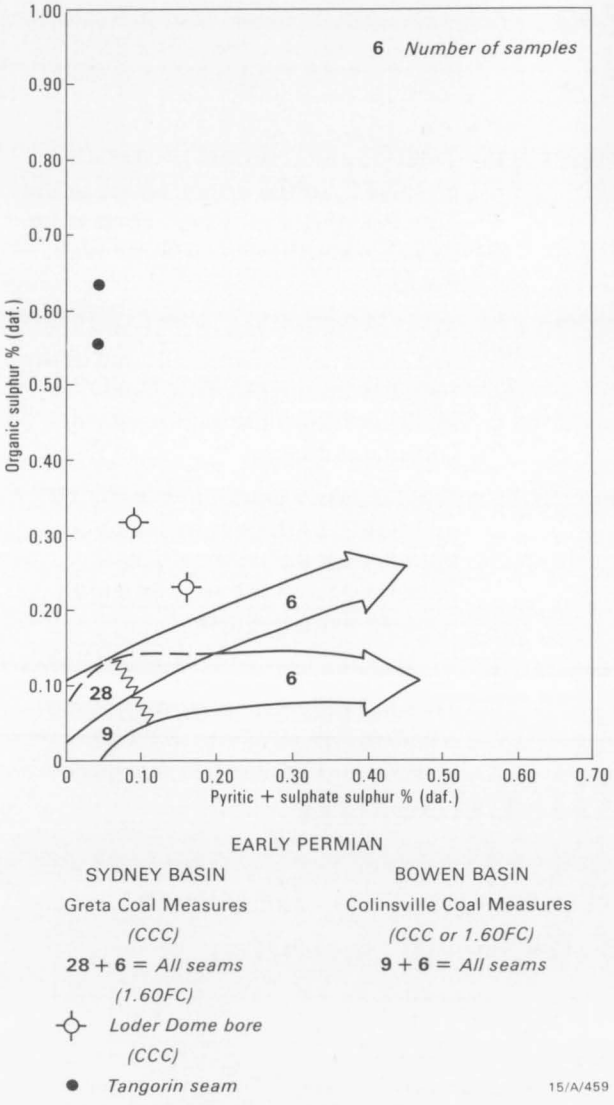


Fig. 20–18. Forms of sulphur (% daf–CCC, RCC or 1.60FC) in seams from the Early Permian Collinsville and Greta Coal Measures.

the low to medium-sulphur coals were controlled by pH, Eh, and iron availability within the peat swamps. However, the data of one seam (Bulli seam — 35 samples) showed no clear correlation between the proportion of pyritic sulphur with vitrinite content, and with Fe, (Ca + Mg) or (Na + K) in the ash. Pyrite genesis in the presence of restricted sulphate levels, accounting for most low to medium-sulphur coals, was probably controlled by complex equilibria which may have been buffered by detrital mineral species and the mineral substrate.

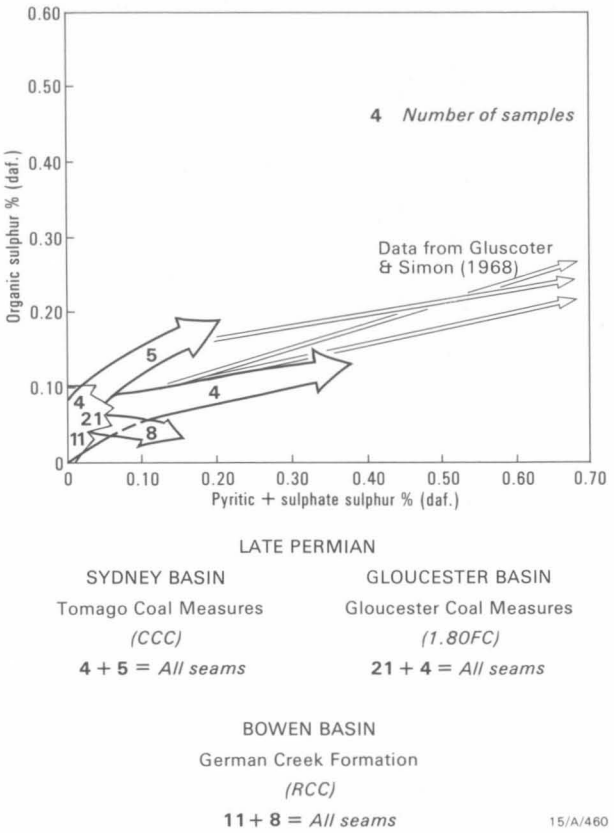


Fig. 20–19. Forms of sulphur (% daf–CCC, RCC or 1.60FC) in seams from the Late Permian German Creek Formation and the Tomago and Gloucester Coal Measures.

Sulphur Content and Petrographic Composition

At the broad scale, there is no unique relationship between total sulphur content and petrographic composition expressed as percentage of vitrinite (mmf). However, high-vitrinite, medium to high-sulphur coals, and low-vitrinite, low-sulphur coals accounts for the majority of Permian coals examined during the project.

When the low and medium total sulphur categories were studied separately, including rarer high-vitrinite, low-sulphur coals and low-vitrinite, high-sulphur coals, there was a small but clear enrichment of total sulphur with increasing vitrinite content. This trend is demonstrated in Fig. 20–20, using low-sulphur, high and low-vitrinite Early Permian coals. Figures 20–21 and 22 show the same trend for low and medium-sulphur coals and their associated vitrinite concentrates from the southern, northeastern and western Sydney Basin. The same trend is clear in Figs 20–23 and 24 for clean coal composites, density-separated vitrinite concentrates, and where available durain and fusain concentrates for several seams. In most cases, the vitrinite content of the vitrain, durain and fusain fractions has been estimated by reference to a few analysed samples. The vitrain samples are usually enriched in total sulphur relative to the clean coal composites and, because the vitrain concentrates were obtained by float-sink separation, some pyritic sulphur has probably been excluded for the medium-sulphur coals. In most cases, the fusain fractions contain less sulphur than

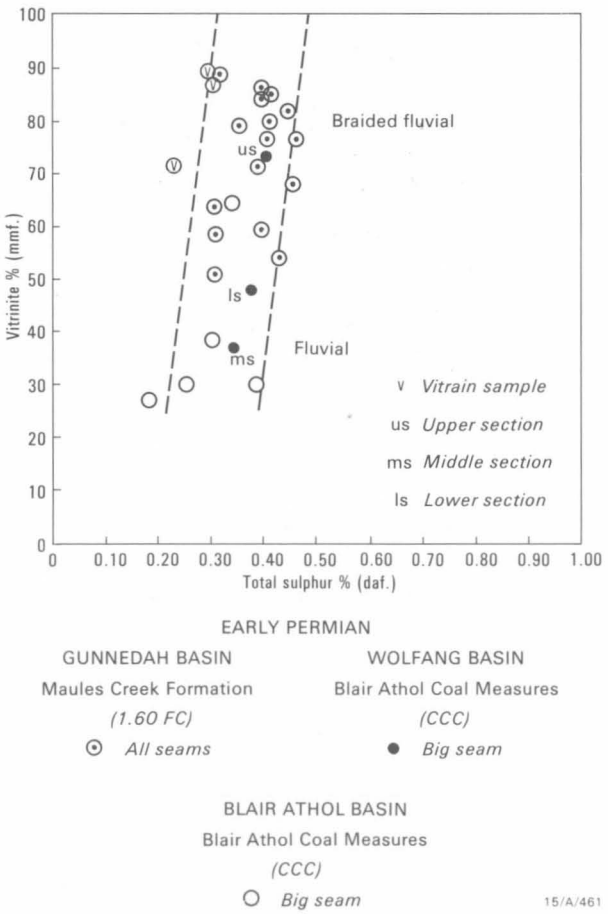


Fig. 20–20. Total sulphur (% daf) versus vitrinite content (% mmf) for seams from the Early Permian Blair Athol Coal Measures and Maules Creek Formation.

the clean coal composites and the durain samples have more sulphur. Average enrichment of the vitrinite concentrates, relative to clean coal composites for paired samples, is shown in Fig. 20–25a for low-sulphur coals and in Fig. 20–25b for medium-sulphur types. The enrichment over the range 0 to 100% vitrinite is about 0.10% for low-sulphur coals and 0.25% for medium-sulphur varieties. The enrichment sulphur with increasing vitrinite content probably reflects the higher reactivity of the less-saturated vitrinite-precursor molecules in the presence of a low level of H_2S produced by decomposition of plant organo-sulphur compounds in the case of low sulphur coals. In the case of the medium-sulphur coals, additional bacterially reduced sulphur from either ponded terrestrial sulphate, possibly with some marine sulphate, may have caused the reaction of the vitrinite precursors and H_2S to go to completion.

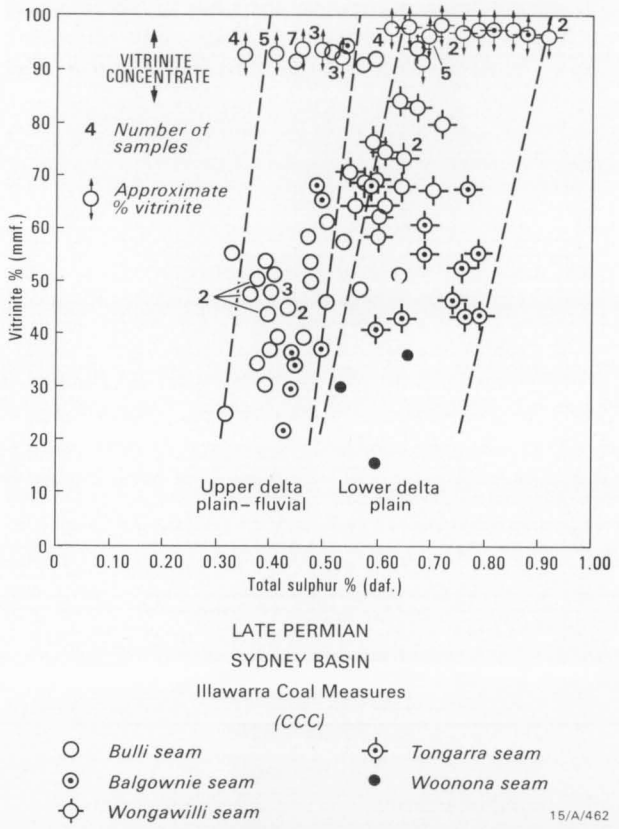


Fig. 20–21. Total sulphur (% daf) versus vitrinite content (% mmf) for seams from the Late Permian Illawarra Coal Measures.

A limited number of analyses to determine forms of sulphur of the lithotypes for low and medium-vitrinite coals are shown in Fig. 20–26. Although some pyritic sulphur may have been neglected for the medium-sulphur seams, the apparent enrichment of pyritic sulphur in durains for low-sulphur seams, suggests that vitrinite in the low-sulphur seams has little pyrite. The sample labelled B in Fig. 20–26 is a durite from the Big seam at Blair Athol. In Fig. 20–24, two of the three Big seam samples show a decrease in total sulphur in the vitrain samples relative to the clean coal composites. This may be due to higher pyrite levels in durain, which constitutes the majority of the Big seam. In the low-sulphur, low-vitrinite fluvial coals, high pH conditions in the original depositional environment probably precluded significant bacterial reduction of sulphate, and pyrite in the durain may have been formed by reaction of decomposition-produced H_2S and iron from clays in the durain.

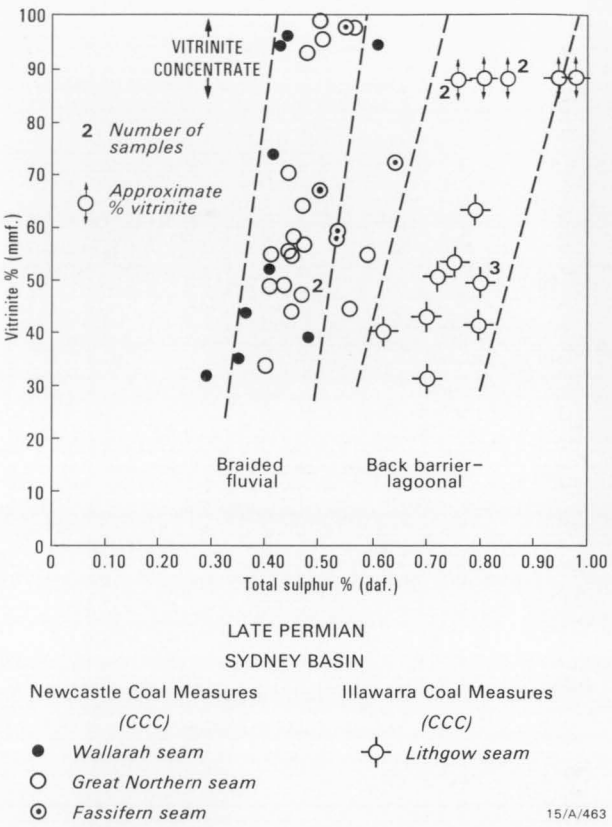


Fig. 20–22. Total sulphur (% daf) versus vitrinite content (% mmf) for seams from the Late Permian Newcastle and Illawarra Coal Measures.

Lateral Variation of Total Sulphur Content

In the following section, lateral variation is discussed for the four Permian horizons in Table 20–1. The sulphur in Figs 20–27 to 34 is based on the weighted averages of analytical data from the selected control points in the CSIRO data-base (see microfiches). The sulphur contents have been adjusted to be representative of 1.60FC's, using the trends in sulphur content for RCC's, CCC's and 1.60FC's outlined earlier in this chapter.

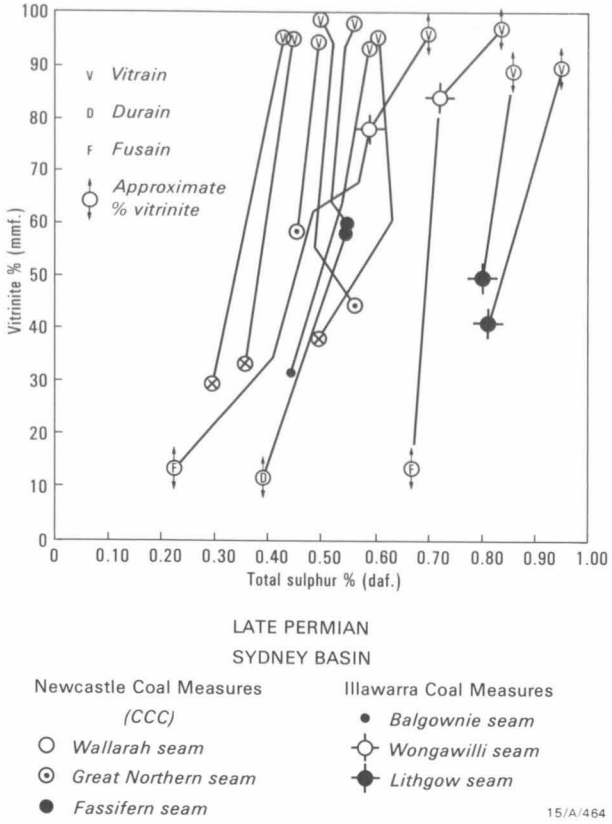


Fig. 20–23. Total sulphur (% daf) versus vitrinite content (% mmf) for lithotype concentrates from the Late Permian Newcastle and Illawarra Coal Measures.

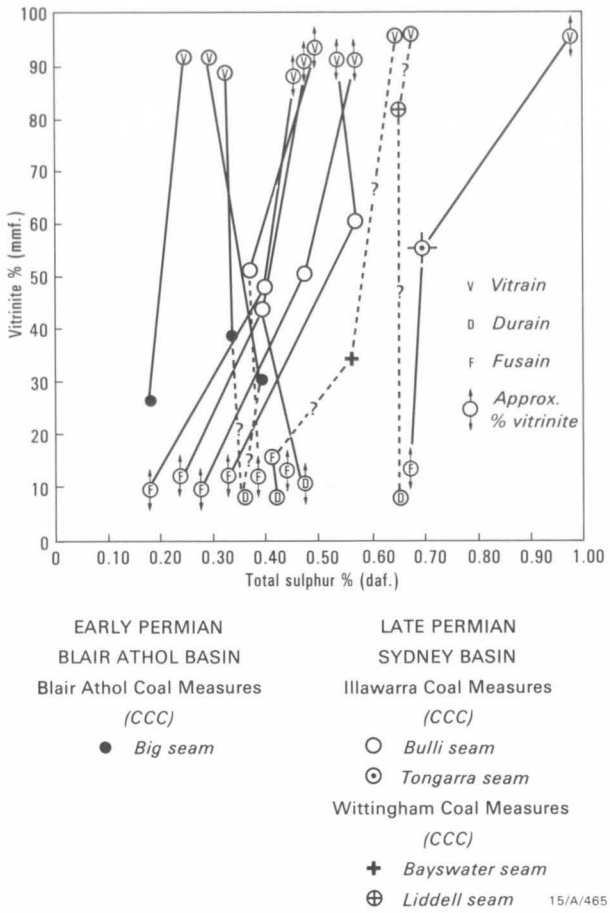


Fig. 20–24. Total sulphur (% daf) versus vitrinite content (% mmf) for lithotype concentrates from the Late Permian Illawarra and Wittingham Coal Measures.

Middle coal measures

The Bowen Basin has mainly high-sulphur coals along the western margin in the Collinsville coal measures to the north and its equivalents to the south. Low-sulphur coals found in the Blair Athol and Wolfang Basins are flanked by medium and then high-sulphur coals of the Aldebaran Sandstone and Back Creek Group (Fig. 20–27).

Low-sulphur coals in the thick northeastern sequence of the Gunnedah Basin, overlie and grade laterally into high-sulphur coals in the southwest (Fig. 20–28). The low-sulphur coals of the Maules Creek Formation pass laterally southwards into low to medium-sulphur coals at Blandford.

In the Sydney Basin, medium-sulphur coals of the Greta Coal Measures at Cessnock and Muswellbrook pass laterally into high-sulphur coals (Fig. 20–28), which are also present in the Clyde Coal Measures in the south.

The Ashford Basin in the New England Fold Belt contains mainly low-sulphur coals (Fig. 20–28).

Lower part of upper coal measures

The German Creek Formation and Moranbah Coal Measures have generally medium-sulphur coals along outcrop in the west of the basin (Fig. 20–29), which pass into high-sulphur coals to the northeast and probably the southeast.

In the Gunnedah Basin, the base of the Black Jack Formation contains mainly medium-sulphur coals, interbedded with a significant number of low-sulphur coals (Fig. 20–30).

The Sydney Basin contains dominantly medium-sulphur coals in the Illawarra Coal Measures in the west, south and southeast (Fig. 20–30). In the northeast, however, medium to high-sulphur coals in the Tomago Coal Measures pass vertically and laterally into low and medium-sulphur coals at the base of the Newcastle Coal Measures. The Wittingham Coal Measures in the north also consist of vertical and lateral intercalations of medium and low-sulphur coals (Fig. 20–30).

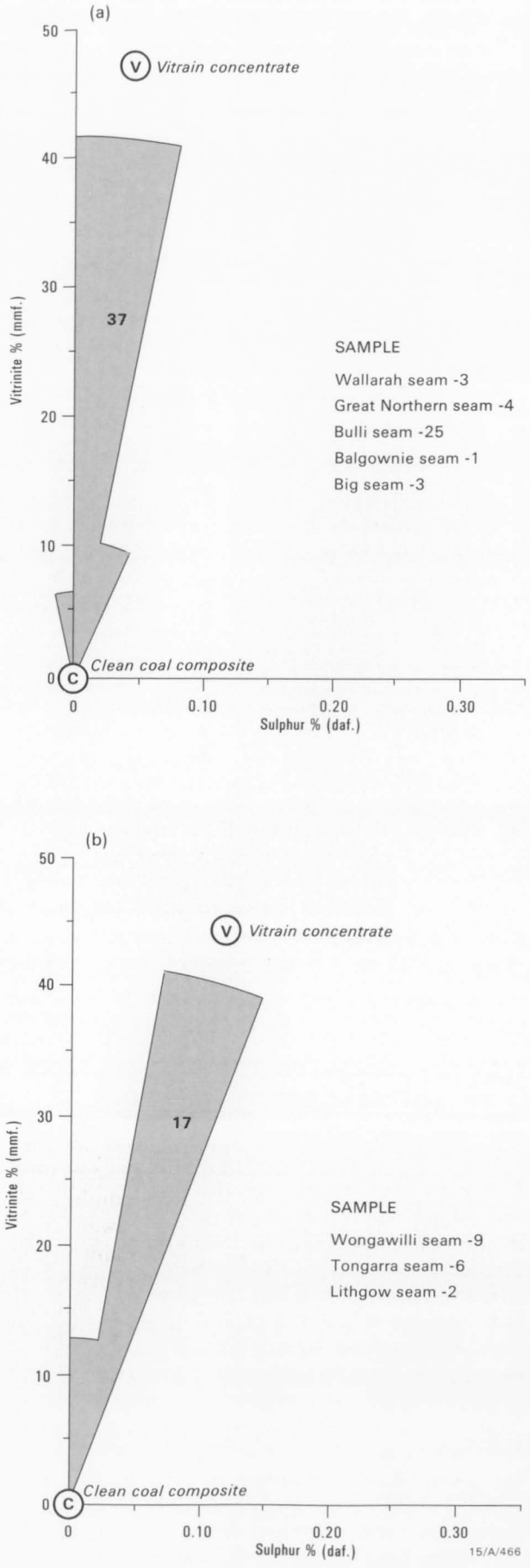


Fig. 20–25a. **Relationship between total sulphur (% daf) and vitrinite content (% mmf) for coals with <0.55 (daf) total sulphur.**

Fig. 20–25b. **Relationship between total sulphur (% daf) and vitrinite content (% mmf) for coals with 0.55–1.0% (daf) total sulphur.**

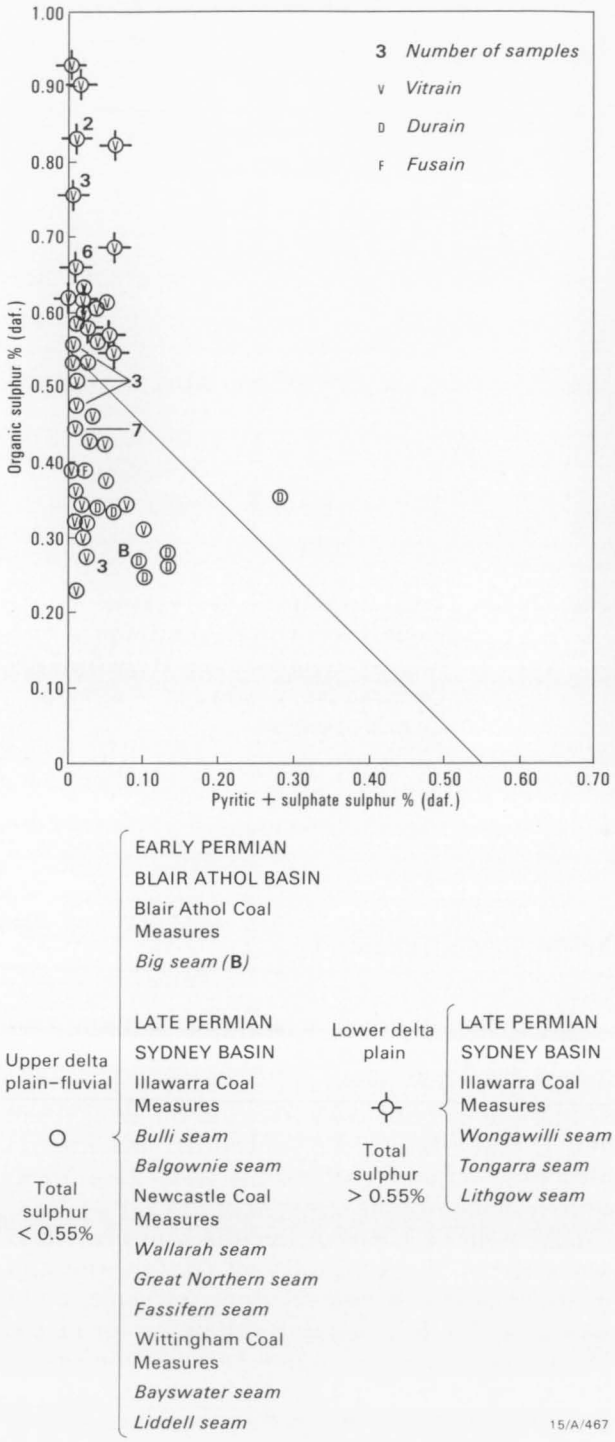


Fig. 20–26. **Forms of sulphur (% daf) in lithotype concentrates from the Early Permian Blair Athol Coal Measures and the Late Permian Wittingham, Newcastle and Illawarra Coal Measures.**

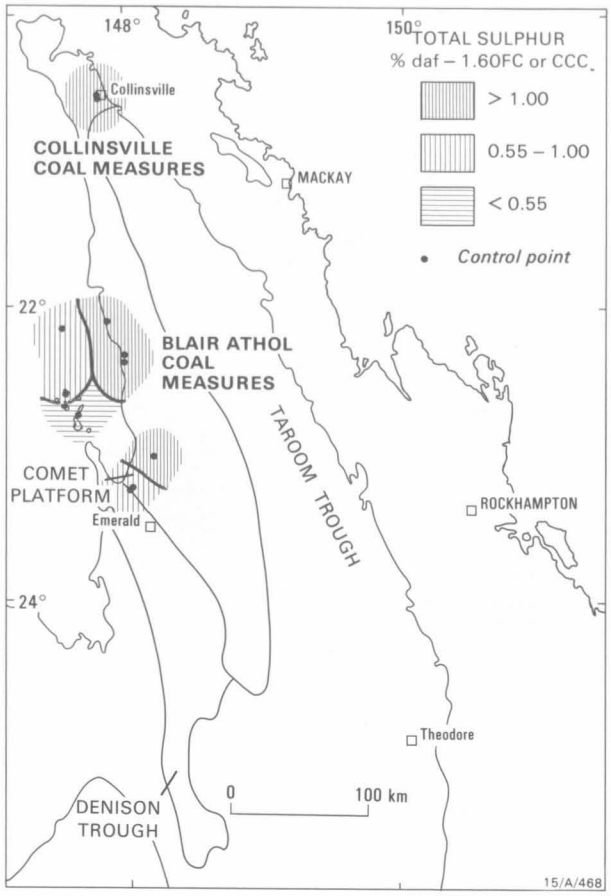


Fig. 20–27. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of middle coal measures from the Gunnedah, Sydney and Ashford Basins.

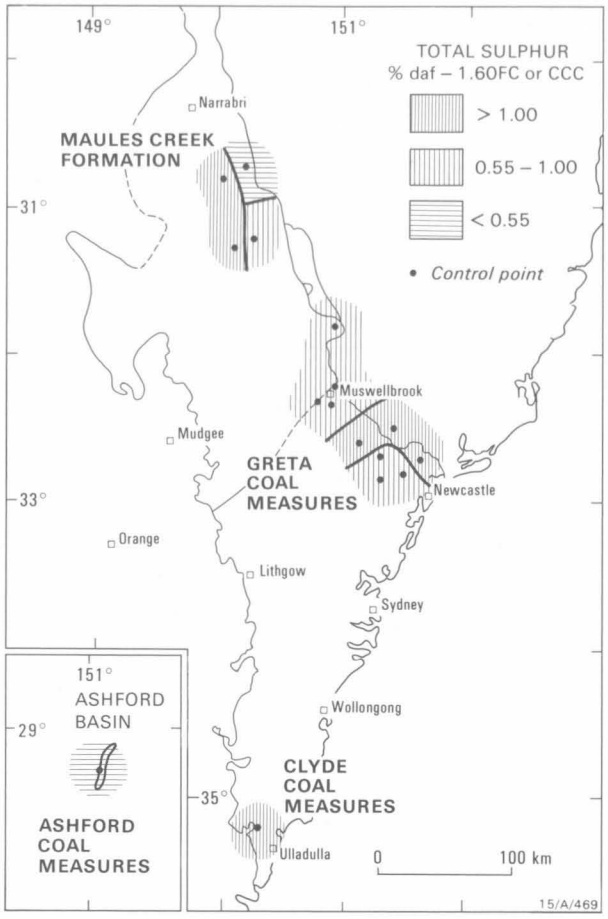


Fig. 20–28. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of middle coal measures from the Gunnedah, Sydney and Ashford Basins.

The Gloucester Basin to the northeast of the Sydney Basin, has mainly medium-sulphur coals at the base of the Late Permian sequence (Fig. 20–30).

In the Oaklands Basin, the thick basal seam is low in sulphur.

Bayswater seam horizon

Sulphur content in the Bayswater seam horizon of the Sydney, Gunnedah and Gloucester Basin varies from low to medium. The Woonona, Lithgow and Ulan seams of the Illawarra Coal Measures in the south and west of the Sydney Basin, generally have a medium sulphur content, with the exception of rare sections towards the basin margin (Fig. 20–31). The Bayswater seam in the northern Sydney Basin, Bowens Road seam in the Gloucester Basin, and Hoskinssons seam in the Gunnedah Basin are generally low in sulphur towards the northern orogenic boundary of the basin. However, the Bayswater seam has a medium sulphur content basinwards (Fig. 20–31).

Top part of upper coal measures

Sulphur content of the Rangal Coal Measures and equivalents in the Bowen Basin ranges from low to medium at the top of the Late Permian. Low-sulphur sections dominate in the northern Bowen Basin and along the western margin. The low-sulphur sections interfinger laterally with medium-sulphur coals towards the centre of the basin (Fig. 20–32). The Baralaba Coal Measures in the southeast have low-sulphur coals in the south, which grade northwards into low and medium-sulphur coals.

In the Galilee Basin, low-sulphur coals prevail in the north, passing laterally into low and medium-sulphur coals southwards (Fig. 20–33). The passage from low to medium-sulphur coals proceeds by a progressive southward increase.

The uppermost seam at the top of the Late Permian Black Jack Formation in the Gunnedah Basin has a mainly high sulphur content, as based on the four analyses available (Fig. 20–34).

In the Sydney Basin, sulphur content for the upper seams ranges from low to medium. Low-sulphur seams dominate in the Illawarra Coal Measures in the south, and Newcastle Coal Measures in the north. The Illawarra Coal Measures in the west have mainly low-sulphur coals, with some medium-sulphur coals basinwards. The upper seams, sampled from several bores from the centre of the basin, have medium or alternating medium and low sulphur contents (Fig. 20–34).

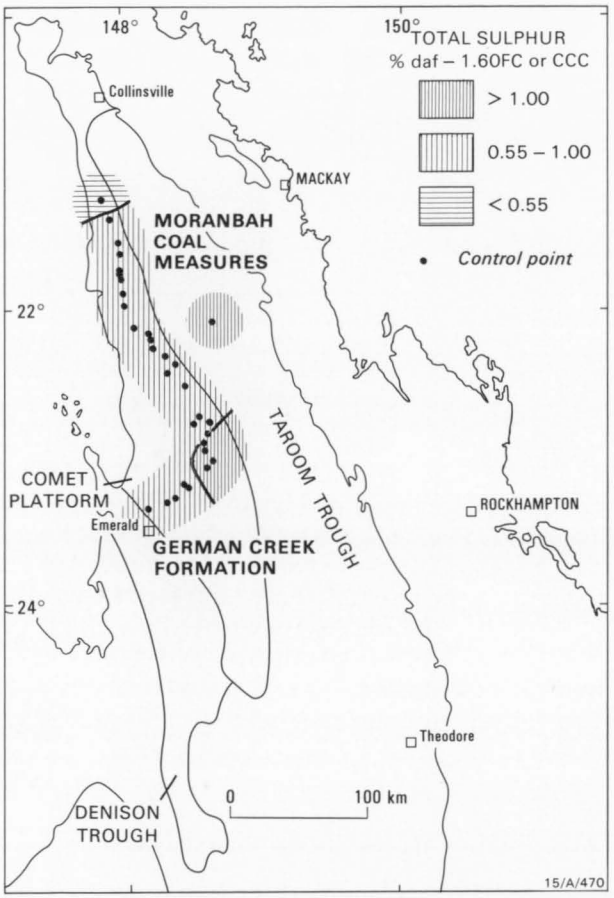


Fig. 20–29. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of lower part of upper coal measures from the Bowen Basin.

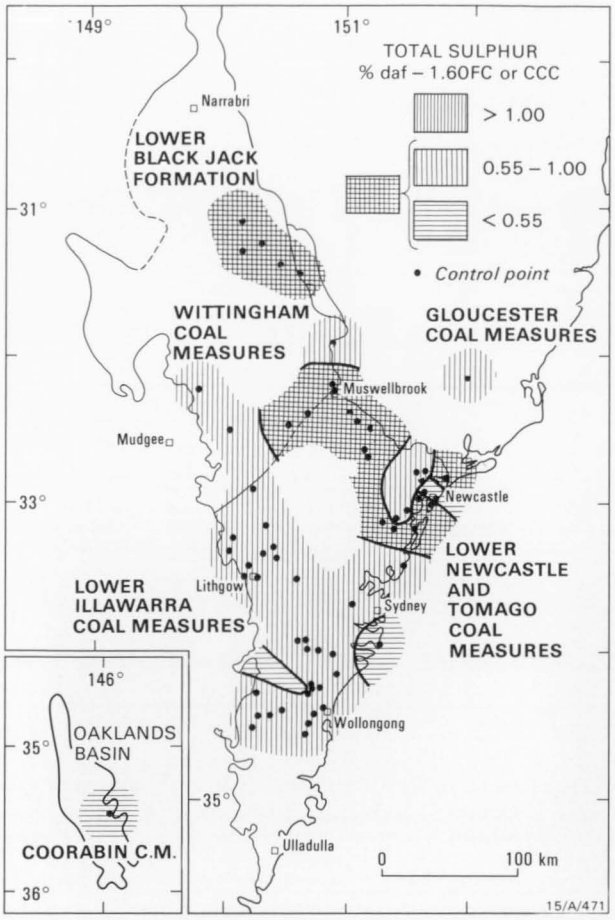


Fig. 20–30. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of lower part of upper coal measures from the Gunnedah, Sydney and Oaklands Basin.

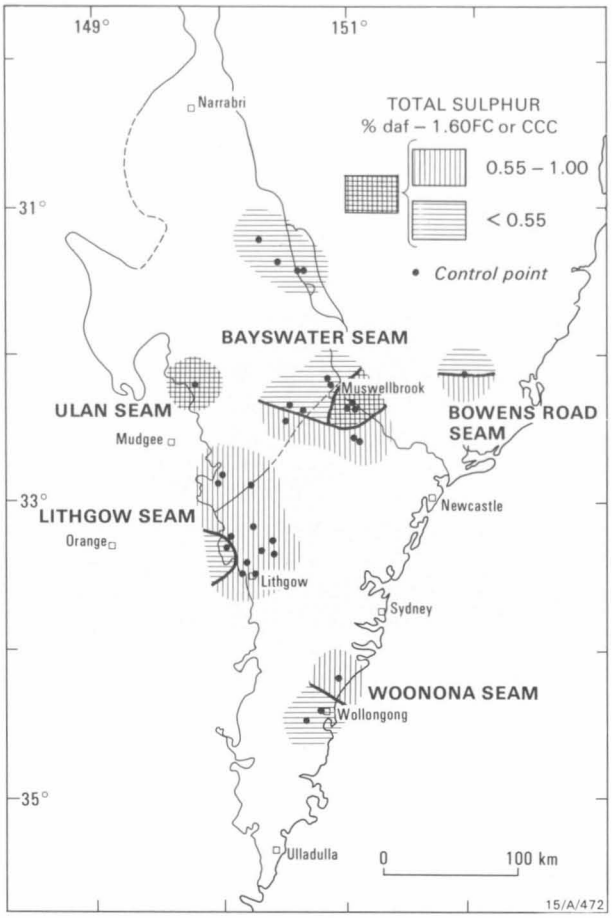


Fig. 20–31. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of lower part of upper coal measures from the Gunnedah, Gloucester and Sydney Basins.

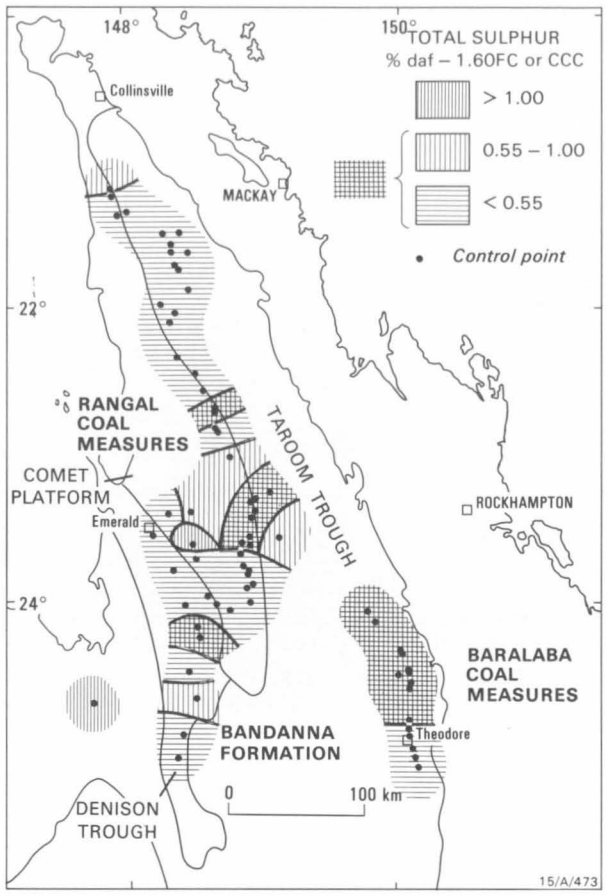


Fig. 20–32. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of top part of upper coal measures from the Bowen Basin.

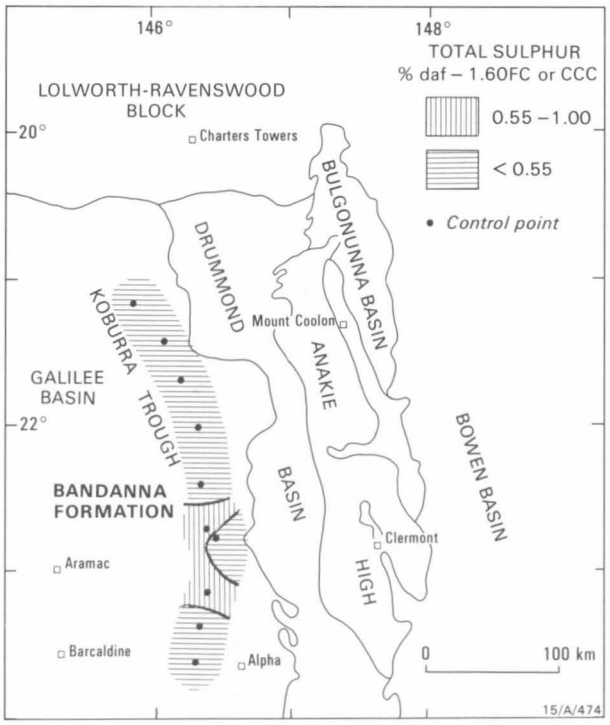


Fig. 20–33. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of top part of upper coal measures from the western Galilee Basin.

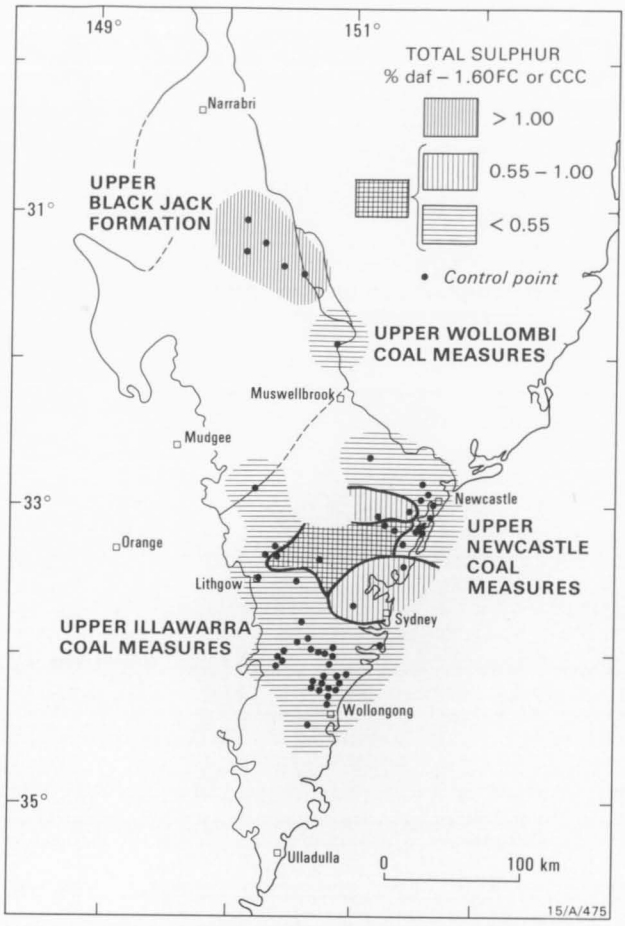


Fig. 20–34. Lateral variation in total sulphur content (% daf–1.60FC or CCC) of top part of upper coal measures from the Gunnedah and Sydney Basins.

Conclusions

The Early Permian coals of the Sydney, Gunnedah and Bowen Basins have both high and low sulphur contents; the latter present towards the basin margins or in the hinterland and the former mainly basinwards.

In the Late Permian, chiefly medium to high-sulphur coals at the base of the sequences pass vertically into low and medium-sulphur coals. In the Sydney and Bowen Basins, low-sulphur coals are confined to the basin margins at the top of the sequences, with medium-sulphur coals found in the basin centres.

Low to medium-sulphur coals from any area show small variation in total sulphur content, but greater variability in the form of sulphur combination. Organically bound sulphur is predominant in the low to medium-sulphur coals, and pyritic sulphur rarely exceeds 50% of the total sulphur. Coals with >1.0% (daf) sulphur, usually show mainly pyrite-associated sulphur.

Suites of low to high-vitrinite, low and medium-sulphur coals show a consistent increase in total sulphur with increasing vitrinite content. The increase is smaller for low-sulphur coals (0.10%S for the range 0–100% vitrinite), probably reflecting only partial saturation of the vitrinite precursors in the presence of limited decompositional H_2S. In medium-sulphur coals, the increase is about 0.25%S in the range 0 to 100% vitrinite (mmf), reflecting more complete reaction in the presence of higher levels of decompositional H_2S and possibly bacterially reduced H_2S from ponded terrestrial or possibly marine sulphate.

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CHAPTER 21

Phosphorus Content of the Permian Coals

by
J.W. Hunt

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Introduction

Phosphorus in coal is of economic importance because of its harmful effect during coking of coal on coke electrodes, and its deleterious effect in even small amounts in steel. To a lesser extent phosphorus can be a problem with fuel coals as a result of the formation of hard, high-temperature, insoluble, crystalline phosphate in stoker-fired boilers.

As a consequence of the economic significance of phosphorus in coal, and the probable control of the original sedimentary depositional factors on phosphorus content, the subject has been reviewed during the Permian Coal Project.

Sources of Phosphorus in Coal

Phosphorus is a minor, but essential, element for plant life, so that it is ubiquitous in coal. The range of phosphorus content (dry weight) in plants is about ten times that in coal (Francis, 1961, p.654). The main source of phosphorus available to living plants is phosphate ions in fresh or marine water.

Phosphate is present principally in plant membranes as phospho-proteins (Francis, 1961, p.147). Organic phosphates are utilized by numerous bacteria and fungi in the form of phosphatase enzymes to produce orthophosphate. The enzymes are most active in soils low in biologically available phosphate and high in organic matter (Halstead, 1964, in Swain, 1970).

Forms of Phosphorus in Coal

Peat represents a significant sink of phosphorus (Moore & Bellamy, 1974, p. 112), but little information is available on forms of phosphorus in peat. Swain (1970, p. 108, 109) reported an increasing total phosphorus content with depth in a recent peat and that the phosphorus occurs probably as either inorganic vivianite or bobierrite, or organic collophane.

Only inorganic phosphorus species have been described from coal. Idiomorphic fluorapatite crystals are the most commonly identified in Australian coals (Cook, 1962; Ward, 1978). Fluorapatite petrifactions in Jurassic and Permian coals of the southern Sydney Basin as isolated grains in vitrinite and inertinite and filling cracks have also been observed. A strontium alumina-phosphate mineral of the goyazite group was found in the same area (Ward, 1978). Phosphorite gels have been described from marine-influenced European coals (Mackowsky, 1968).

Origin of Phosphorus in Coal

Idiomorphic apatite crystals are usually considered to be detrital in origin because of their association with either inertinite or mineral-rich portions of the coal. However, Francis (1961) assumed that fluorapatite-rich floor rocks have acquired their phosphorus by hydrolisation of the originally organically bound phosphorus to phosphoric acid, which then reacted with basic constituents of the peat to form apatite. Vein-filling material, petrifactions and phosphorite gels are indicative of secondary origin.

Chemical Conditions of Apatite Genesis

Apatite forms *in vitro* at pH as low as 6.8, and can originate under both oxidising and reducing conditions in nature (McConnell, 1979). He described both replacement of silica by phosphate and the reverse (phosphate by silica) in reducing conditions; and Cook (1970) attributed phosphatisation and calcitisation of silica as well as reverse reaction to pH fluctuation, probably in the range of pH 7 to 10. In general, however, the interaction of pH, Eh and organic catalysts in the formation of phosphate minerals are poorly understood.

Total Phosphorus Content of Coal

Total phosphorus content of coal is referred to here as low (<0.010%db), medium (0.010–0.030%db) and high (>0.030%db), with reference to 1.60 relative density float fraction composites (1.60FC) or clean coal composites (CCC), following the British (Crossley, 1948) classification for air dry coals. Using Bowen Basin coals (see Fig. 21–1 for locations), a comparison of %P on an air dry basis (Figs 21–2a, c and e) with %P on a dry (moisture-free) basis (Figs 21–2b, d and f) for the same samples, shows that there is generally a significant increase in the number of sample data in the low or medium classes when the diluting effect of moisture (1–8%) is removed. Presentation of the data on a dry ash-free and an ash basis was also considered, but neither has increased the comprehensibility in relation to original depositonal environment, as discussed in Chapter 24. As a result of the "patchy" distribution of phosphorus in coal, greater weight has been given to higher values. Thus, the category "high" usually includes many "low" and "medium" values and, similarly, the category "medium" includes many "low" values.

Fig. 21–1. Location of the Permian coal basins.

Phosphorus Content of the Permian Coals

In the following section, phosphorus in the Australian Permian coals is considered by age and basin. Phosphorus content is shown in Figs 21–3 to 5 for the Early Permian and Figs 21–6 to 12 for the Late Permian.

Early Permian

Marginal basins

Bowen Basin. The Bowen Basin contains Early Permian coal measures at two horizons. The lower one, in the Reids Dome beds, was deposited early in the Early Permian and the upper coal-bearing sequence, which includes the Collinsville Coal Measures and equivalents in the Back Creek Group, formed late in the Early Permian.

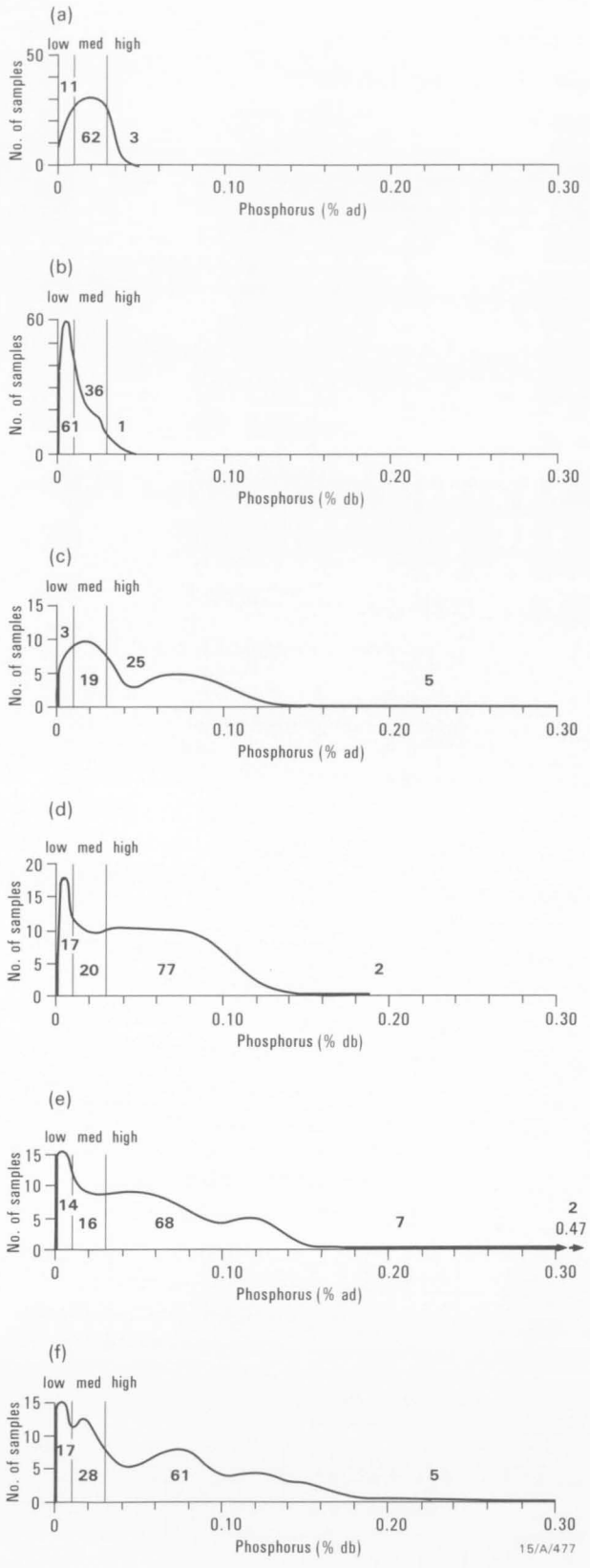


Fig. 21–2a. Phosphorus content (% ad) for subsections of the Big Seam in the Early Permian Blair Athol Coal Measures from the Blair Athol Basin.

Fig. 21–2b. Phosphorus content (% db) for subsections (S) of the Big Seam in the Early Permian Blair Athol Coal Measures from the Blair Athol Basin.

Fig. 21–2c. Phosphorous content (%ad) for raw coal composites of seams in the Late Permian German Creek Formation from the Bowen Basin.

Fig. 21–2d. Phosphorus content (% db) for clean coal composites or 1.60 relative density float fraction composites of seams in the Late Permian German Creek Formation from the Bowen Basin.

Fig. 21–2e. Phosphorous content (%ad) for raw coal composites (RCC) of seams in the Late Permian Rangal Coal Measures from the Bowen Basin.

Fig. 21–2f. Phosphorus content (% db) for clean coal composites (CCC) or 1.60 relative density float fraction composites (1.60FC) of seams in the Late Permian Rangal Coal Measures from the Bowen Basin.

Two seams analysed from the Reids Dome beds in Taroom 11/11A have a high phosphorus content (Fig. 21–3a). The lowermost seams (Bowen and Blake) in the Collinsville Coal Measures are high in phosphorus, but the overlying seams are mainly low to medium in phosphorus (Fig. 21–3b). In the Blair Athol and Wolfang Basins, the basal thick seam, and the thin upper seams at Wolfang, are low to medium in phosphorus (Figs 21–3c and 3d).

Gunnedah Basin. Limited data are available for late Early Permian coals in the Maules Creek Formation of the Gunnedah Basin. Coals within the thick sequence in the northeast are mainly low in phosphorus, whereas a seam from the thin sequence in the Maules Creek and Leard Formations from the southwest is high in phosphorus (Fig. 21–4a).

Sydney Basin. Phosphorus data are available for the late Early Permian Greta Coal Measures at Cessnock, Muswellbrook and Glendonbrook in the north and northeast of the Sydney Basin. In the Greta Coal Measures at Cessnock, phosphorus content is low to medium for the Homeville seam in the base, and medium to high for the overlying marine-influenced Greta seam (Fig. 21–4b). Phosphorus is low to high for the lower seams in the Greta Coal Measures at Muswellbrook and high for the upper seams (Fig. 21–4c). A single seam (Tangorin) at Glendonbrook (in the outlying Cranky Corner Basin) is medium to high in phosphorus (Fig. 21–4d).

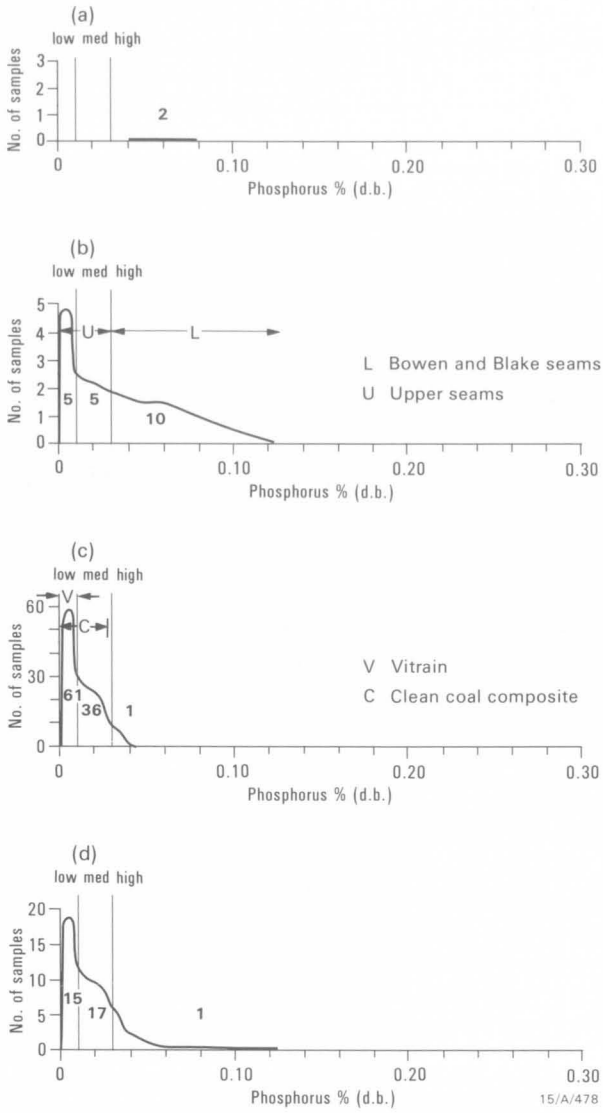


Fig. 21–3a. Phosphorus content (% db–CCC) of seams in the Early Permian Reids dome beds from the Bowen Basin.

Fig. 21–3b. Phosphorus content (% db–CCC or 1.60FC) of seams in the Early Permian Collinsville Coal Measures from the Bowen Basin. L = Bowen and Blake seams; U = upper seams.

Fig. 21–3c. Phosphorus content (% db–RCS) of seams of the Big seam in the Early Permian Blair Athol Coal Measures from the Blair Athol Basin. V = vitrain; C = clean coal composite.

Fig. 21–3d. Phosphorus content (% db–1.60FS) of the Big seam in the Early Permian Blair Athol Coal Measures from the Wolfang Basin.

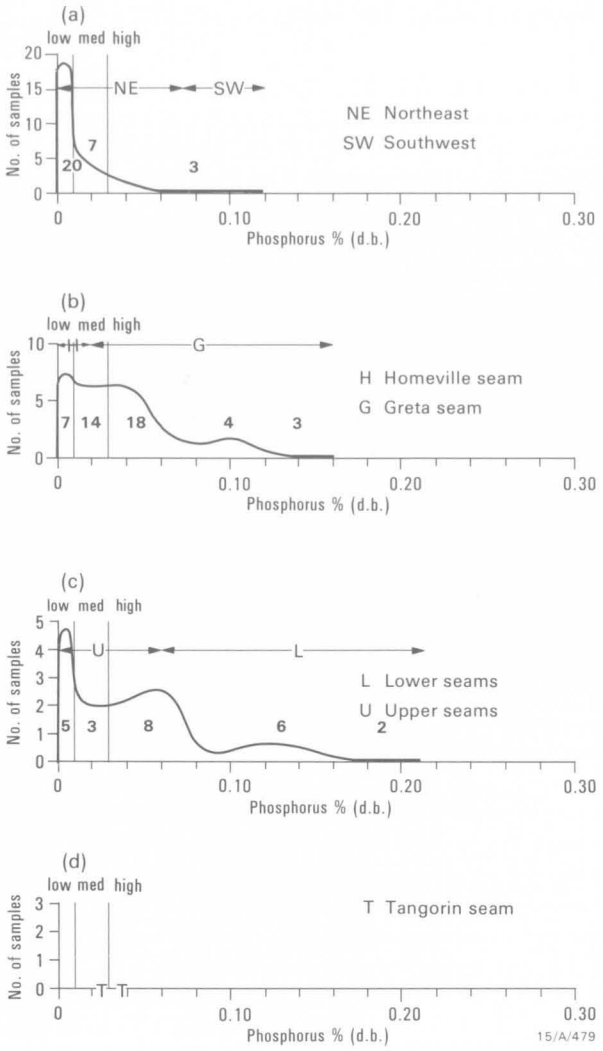


Fig. 21–4a. Phosphorus content (% db–1.60FS) of seams in the Early Permian Maules Creek and Leard Formations from the Gunnedah Basin. NE = northeast; SW = southwest.

Fig. 21–4b. Phosphorus content (% db–CCC or 1.60FC) of seams in the Early Permian Greta Coal Measures from the Cessnock area of the Sydney Basin. H = Homeville seam; G = Greta seam.

Fig. 21–4c. Phosphorus content (% db–CCC or 1.60FC) of seams in the Early Permian Greta Coal Measures from the Muswellbrook area of the Sydney Basin. L = Lower seams; U = upper seams.

Fig. 21–4d. Phosphorus content (% db–CCC) of the Tangorin seam in the Early Permian Greta Coal Measures from the Cranky Corner Basin. T = Tangorin seam.

Intracratonic basins

Ashford Basin. The Ashford Basin is within the orogenic New England Fold Belt east of the Gunnedah Basin and north of the Sydney Basin (Fig. 21–1). The Ashford seam is medium to high in phosphorus (0.020–0.050%db).

Arckaringa Basin. This basin is an intracratonic Permian basin of deep marginal grabens or half grabens and a large central area of shallow basement. Phosphorus content of a single seam from the Mt. Toondina Formation in the Lake Phillipson area is low (0.004%db).

Late Permian

Marginal basins

Bowen Basin. Economic coal in the Bowen Basin formed early and late in the Late Permian, and although the intervening strata are coal-bearing, the frequency and thickness of tuff bands throughout has precluded the coals from being economically viable. The early Late Permian German Creek Formation is overlain by the marine MacMillan Formation, which interfingers with the partly laterally equivalent Moranbah Coal Measures. They, in turn, are overlain through most of the basin by the uneconomic coal-bearing Fair Hill and Burngrove Formations or Fort Cooper Coal Measures. Later in the Late Permian, economic coals were developed throughout most of the basin: they are the Rangal Coal Measures in the north and centre, the Baralaba Coal Measures in the southeast, and the Bandanna Formation in the southwest (see Table 21–1).

Seams in the German Creek Formation are mainly high in phosphorus (Fig. 21–5a), but a large proportion of seams in the Moranbah Coal Measures to the north, are low in phosphorus (Fig. 21–5b).

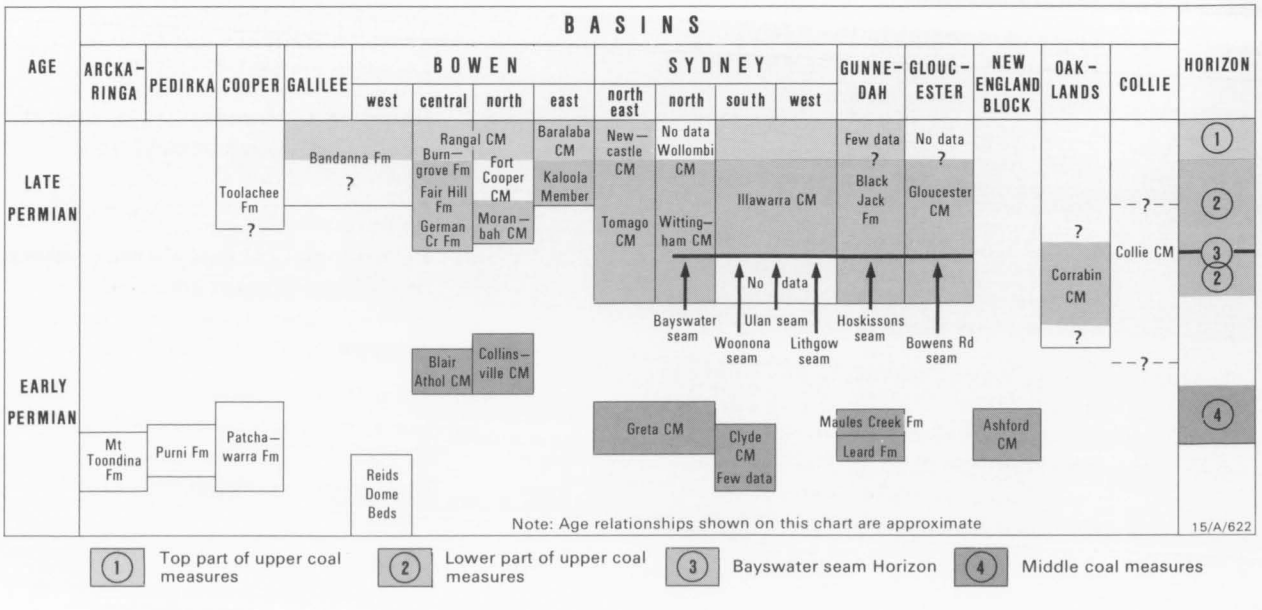
Phosphorus content of seams from the Fair Hill Formation in Emerald NS2 is shown in Fig. 21–5c. The seams are high in ash and phosphorus is low. The overlying Burngrove Formation, and equivalent Kaloola Member in the southeast, contain low to medium-phosphorus seams (Fig. 21–5d).

Phosphorus in the Baralaba Coal Measures in the southeast ranges from low to high (Fig. 21–6a). In the Rangal Coal Measures, phosphorus is mainly high in the north, and low to high in the centre of the basin (Figs 21–6b and 6c). Seams in the Bandanna Formation in the southwest have dominantly medium to high phosphorus contents (Fig. 21–6d).

Gunnedah Basin. A limited amount of data is available for seams in the Late Permian Black Jack Formation in the Gunnedah Basin. The lower seams are low in phosphorus (Fig. 21–7a). The Hoskissons seam, which is worked in the basin, is also low in phosphorus (Fig. 21–8a), and the overlying seams are low to high in phosphorus (Fig. 21–9a).

Sydney Basin. Coal-bearing facies formed in the Sydney Basin throughout the Late Permian. In the northeast, around Newcastle, the Tomago and overlying Newcastle Coal Measures have mainly economic coal, with the exception of a barren interval in the middle of the former and the tuff-banded coals in the middle of the latter. Their equivalents in the Upper Hunter Valley to the north are the Wittingham and overlying Wollombi Coal Measures, and the latter are usually highly tuff-banded and uneconomic. In the south and

TABLE 21–1. SIMPLIFIED CORRELATION CHART FOR THE PERMIAN COAL BASINS, SHOWING HORIZONS USED IN THE PALAEOGEOGRAPHIC RECONSTRUCTIONS



west of the Sydney Basin, the Illawarra Coal Measures have equivalents of the northern sequences (Table 21–1).

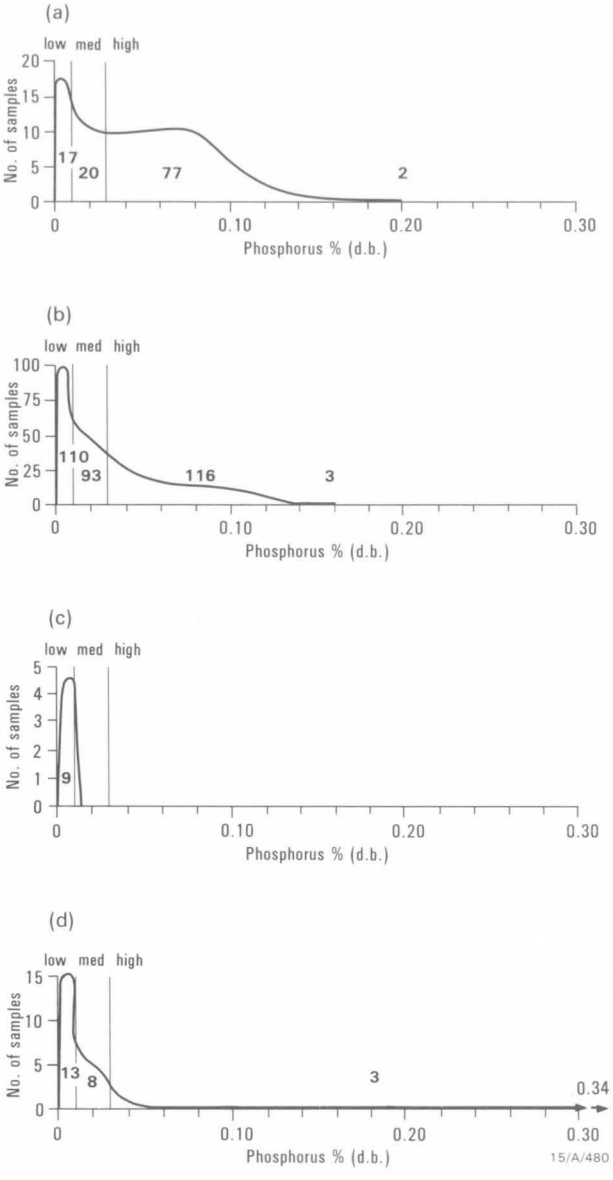


Fig. 21–5a. **Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian German Creek Formation from the Bowen Basin.**

Fig. 21–5b. **Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Moranbah Coal Measures from the Bowen Basin.**

Fig. 21–5c. **Phosphorus content (% db–1.60FC) of seams in the Late Permian Fair Hill Formation from the Bowen Basin.**

Fig. 21–5d. **Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Burngrove Formation and Kaloola Member from the Bowen Basin.**

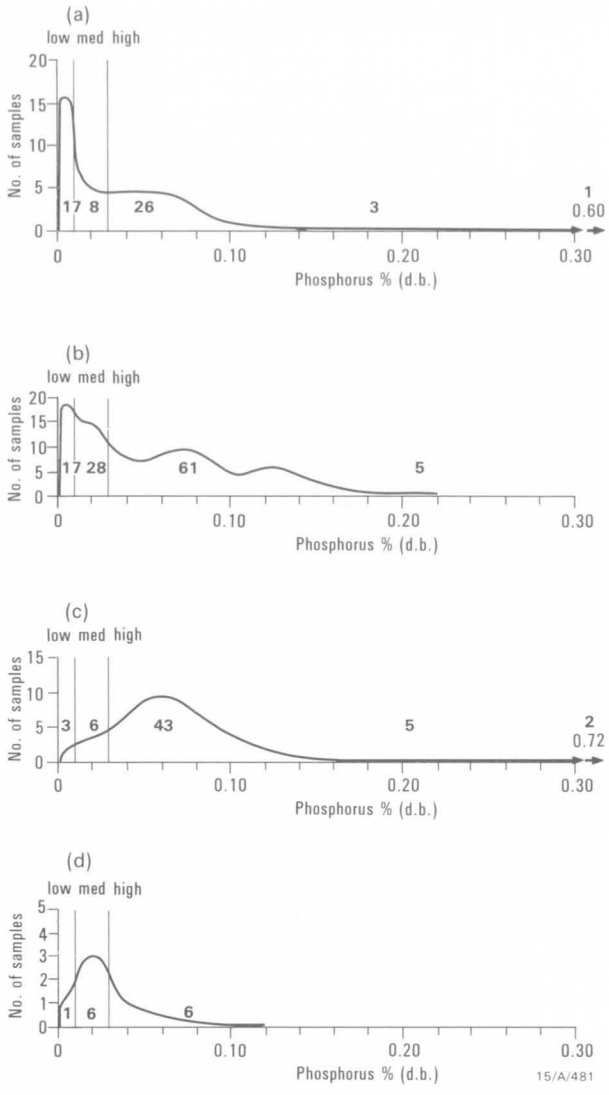


Fig. 21–6a. **Phosphorus content (% db–1.60FC and CCC) of seam in the Late Permian Baralaba Coal Measures from the southeastern Bowen Basin.**

Fig. 21–6b. **Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Rangal Coal Measures from the central Bowen Basin.**

Fig. 21–6c. **Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Rangal Coal Measures from the northern Bowen Basin.**

Fig. 21–6d. **Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Bandanna Formation from the southwestern Bowen Basin.**

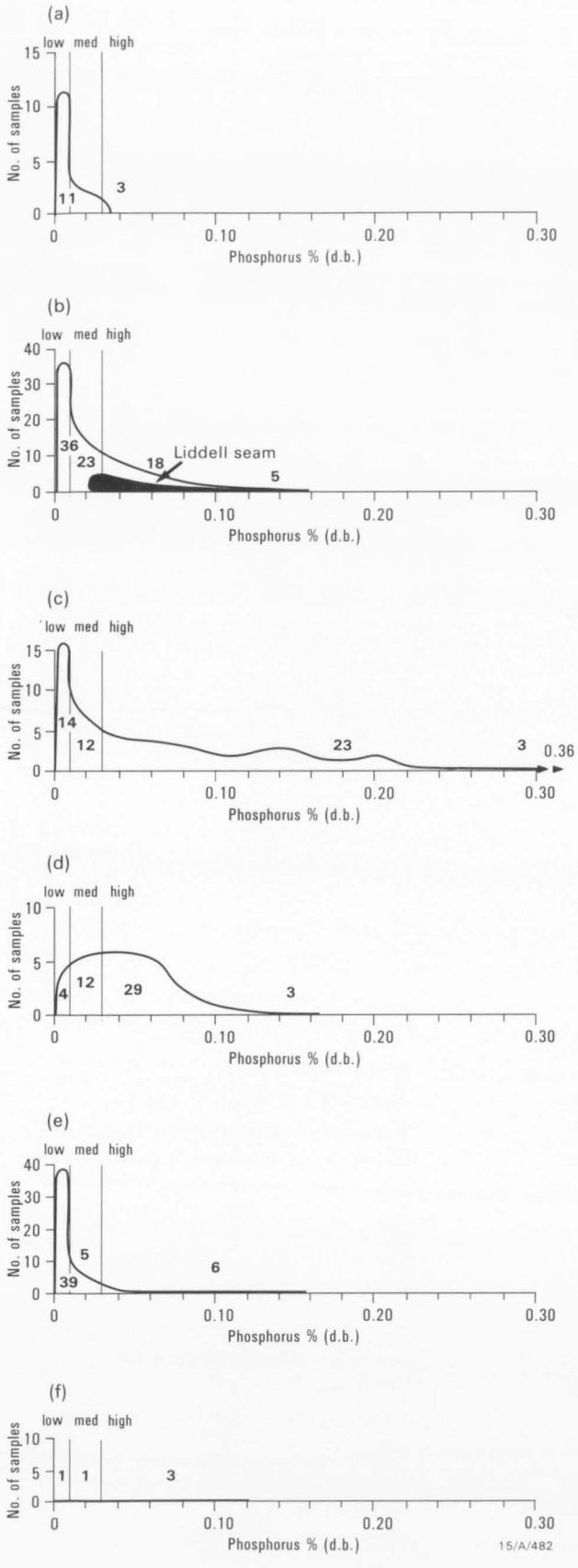


Fig. 21–7a. Phosphorus content (% db–1.60FC or RCC) of the lower seams (excluding the Hoskissons) in the Late Permian Black Jack Coal Formation from the Gunnedah Basin.

Fig. 21–7b. Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Wittingham Coal Measures (excluding the Bayswater) from the northern Sydney Basin.

Fig. 21–7c. Phosphorus content (% db–1.60FC or CCC) of seams in the Late Permian Tomago Coal Measures from the northeastern Sydney Basin.

Fig. 21–7d. Phosphorus content (% db–CCC or 1.60FC) of the lower seams in the Late Permian Newcastle Coal Measures from the northeastern Sydney Basin.

Fig. 21–7e. Phosphorus content (% db–CCC or 1.60FC) of the lower seams in the Late Permian Illawarra Coal Measures (excluding the Woonona and Lithgow) from the southern and western Sydney Basin.

Fig. 21–7f. Phosphorus content (% db–1.80FC) of the lower seams in the Late Permian Gloucester Coal Measures (excluding the Bowens Road) from the Gloucester Basin.

Phosphorus in the Wittingham Coal Measures is generally low to medium (Fig. 21–7b), except for the Bayswater seam which is low to high (Fig. 21–8b) and the Liddell seam medium to high. Low to high-phosphorus seams in the Tomago and basal Newcastle Coal Measures (Figs 21–7c and d) are overlain by mainly low-phosphorus seams in the upper part of the Newcastle Coal Measures (Fig. 21–9b). A 1.60 relative density float-fraction sample of a high-phosphorus seam in the Tomago Coal Measures revealed under a scanning electron microscope a calcium phosphate mineral (with minor strontium), principally as micron-sized grains and intimately mixed with cell-filling clay. A calcium phosphate mineral, filling cells in semifusinite, was also observed.

In the Illawarra Coal Measures from the south and west of the Sydney Basin, no phosphorus data are available for seams beneath correlatives of the Bayswater (Woonona, Lithgow and Ulan), which are low to medium in phosphorus (Fig. 21–8c). Seams in the base of the overlying sequence are low to high in phosphorus (Fig. 21–7e) and the upper seam mainly high in phosphorus (Fig. 21–9c).

Gloucester Basin. Phosphorus in seams of the Gloucester Coal Measures (excluding the Bowens Road seam) ranges from low to high (Fig. 21–7f), and is mainly high in the basal Dewrang Formation. The Bowens Road seam, which may be an equivalent of the Bayswater, has a medium phosphorus content (Fig. 21–8d).

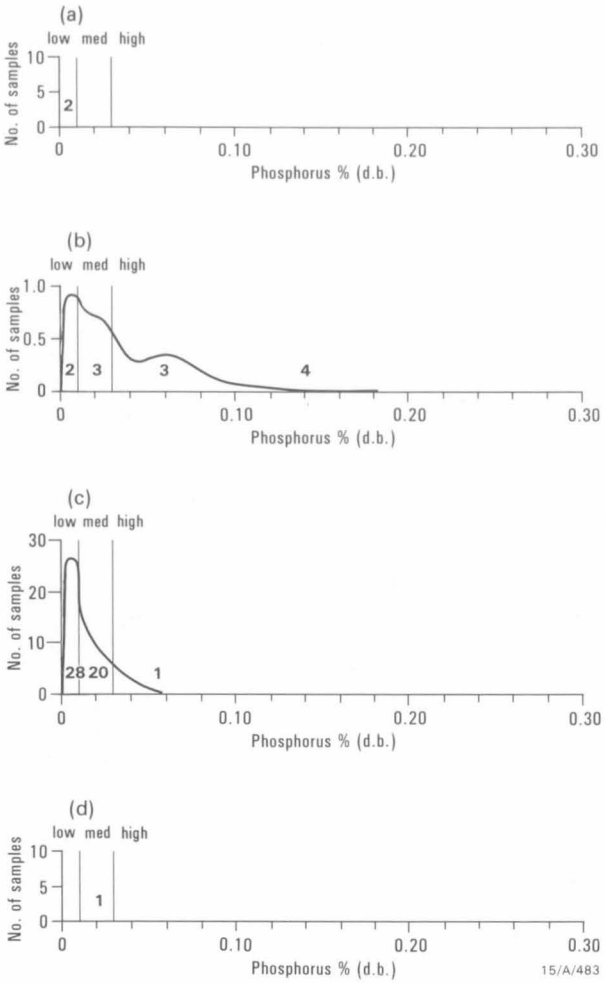


Fig. 21–8a. **Phosphorus content (% db–CCC or 1.60FC) of Late Permian Hoskissons seam from the Gunnedah Basin.**

Fig. 21–8b. **Phosphorus content (% db–CCC or 1.60FC) of the Late Permian Bayswater seam from the northern Sydney Basin.**

Fig. 21–8c. **Phosphorus content (% db–CCC or 1.60FC) of the Late Permian Woonona, Lithgow and Ulan seams from the southern and western Sydney Basin.**

Fig. 21–8d. **Phosphorus content (% db–CCC or 1.60FC) of the Late Permian Bowens Road seam from the Gloucester Basin.**

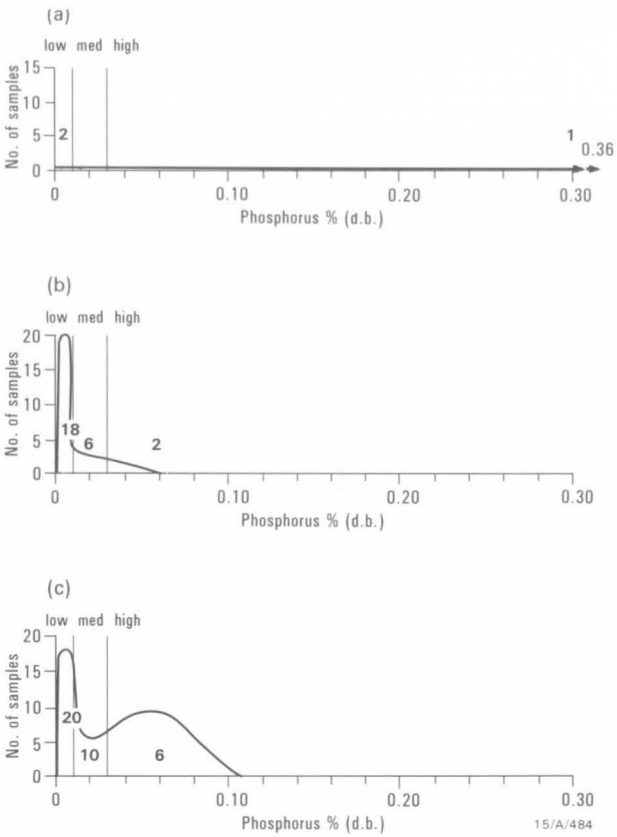


Fig. 21–9a. **Phosphorus content (% db–CCC or 1.60FC) of the upper seams in the Late Permian Black Jack Formation from the Gunnedah Basin.**

Fig. 21–9b. **Phosphorus content (% db–CCC or 1.60FC) of the upper seams in the Late Permian Newcastle Coal Measures from the northeastern Sydney Basin.**

Fig. 21–9c. **Phosphorus content (% db–CCC or 1.60FC) of the upper seams in the Late Permian Illawarra Coal Measures from the southern and western Sydney Basin.**

Intracratonic basins

Galilee Basin. A thin sequence of Late Permian coal measures in the Bandanna Formation is exposed only along the eastern margin of the Galilee Basin. Phosphorus is mainly low to medium (Fig. 21–10a), although the geographic distribution is patchy.

Oaklands Basin. The Coorabin Coal Measures at the top of the sequence in the Oaklands Basin have only a few seams. The basal thick seam in the Oaklands Basin has a low phosphorus content (Fig. 21–10b).

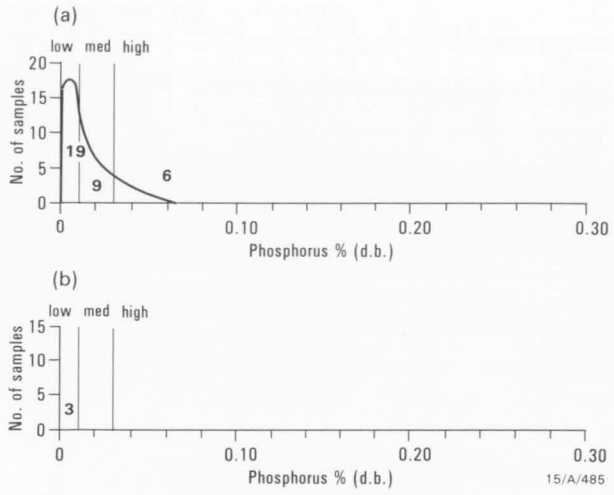


Fig. 21–10a. Phosphorus content (% db–1.90FC) of seams in the Late Permian Bandanna Formation from the Galilee Basin.

Fig. 21–10b. Phosphorus content (% db–CCC or 1.60FC) of the Lanes Shaft seam in the Late Permian Coorabin Coal Measures from the Oaklands Basin.

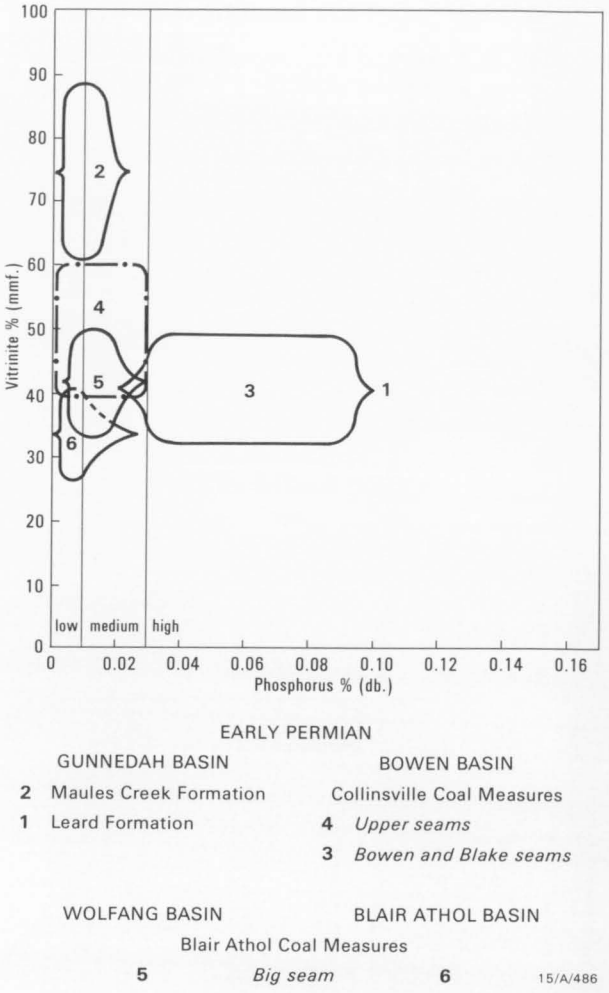


Fig. 21–11. Vitrinite (% mmf) and phosphorus (% db) of Early Permian seams from the Bowen, Gunnedah, Wolfang and Blair Athol Basins.

Discussion

Vertical Variation in Phosphorus Content and Relationship to Petrographic Composition

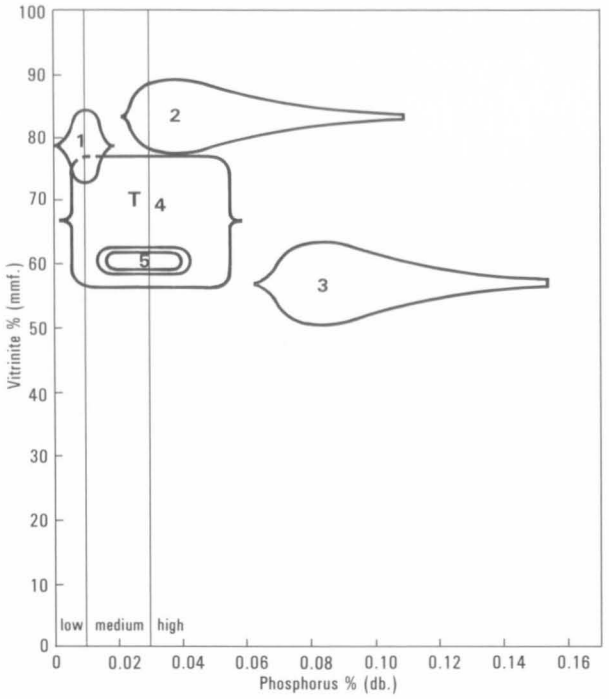
Early Permian sequences

In the Early Permian, a trend of decreasing phosphorus content up sequence is apparent for both the Bowen and Gunnedah Basins (Fig. 21–11). Data of the Gunnedah Basin are sparse, but a low-vitrinite seam from the Leard Formation in the southwest is high in phosphorus. It is probably equivalent to the base of the thick northeastern sequence with low-phosphorus coals. In the Sydney Basin, phosphorus decreases up the sequence in the Greta Coal Measures at Muswellbrook, but increases up the sequence at Cessnock (Fig. 21–12). In cases where phosphorus decreases up the sequence, there is an accompanying increase in vitrinite content. However, low-vitrinite seams in the small intracratonic Blair Athol and Wolfang Basins are only low to medium in phosphorus (Fig. 21–11), whereas in the Ashford Basin, the high-vitrinite Ashford seam is medium to high in phosphorus (Fig. 21–12).

Late Permian sequences

Phosphorus content is predominantly medium and high for high-vitrinite seams in both the German Creek Formation and the Moranbah Coal Measures in the Bowen Basin (Fig. 21–13). Limited analysis of high-vitrinite seams in the overlying Fair Hill Formation shows that they are low in phosphorus. In the top of the sequence, there is a trend of increasing phosphorus with decreasing vitrinite for the Rangal and Baralaba Coal Measures. Detailed analysis at the subsection level of the Taurus seam in the Rangal Coal Measures from Blackwater to Sirius Creek in the central Bowen Basin, demonstrates that high phosphorus contents are associated with the low-vitrinite upper part of the seam (Fig. 21–14). Phosphorus, however, decreases southward and is low irrespective of petrographic composition (Shibaoka, 1971).

Limited data available in the Gunnedah Basin indicate no trend in phosphorus with petrographic composition (Fig. 21–15).



EARLY PERMIAN
SYDNEY BASIN
Greta Coal Measures
Cessnock — Muswellbrook
2 *Greta seam* — **4** *Upper Seams*
1 *Homeville seam* — **3** *Lower seams*

CRANKY CORNER BASIN
T *Tangorin seam*

ASHFORD BASIN
Ashford Coal Measures
5 *Ashford seam*

15/A/487

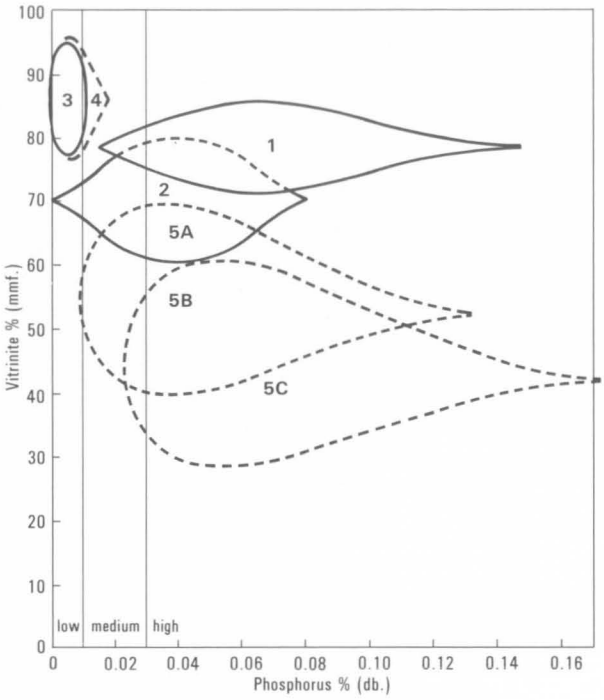
Fig. 21–12. Vitrinite (% mmf) and phosphorus (% db) of Early Permian seams from the Sydney and Ashford Basins.

In the Wittingham Coal Measures of the northern Sydney Basin, high-vitrinite seams show consistently low to medium phosphorus content, with the exception of the high-vitrinite Liddell seam and the low-vitrinite Bayswater seam (Fig. 21–15).

The Tomago and Newcastle Coal Measures in the northeastern Sydney Basin have high-vitrinite, high-phosphorus seams in the base, with low to medium-vitrinite, low-phosphorus seams in the top (Fig. 21–16). Tuff-banded seams in the middle of the Newcastle Coal Measures have not been analysed for phosphorus.

Data are not available for seams in the base of the Illawarra Coal Measures in the south and west of the Sydney Basin. Low-vitrinite equivalents of the Bayswater seam (Lithgow, Woonona and Ulan seams) are low to medium in phosphorus. In the overlying high-vitrinite seams, phosphorus decreases from high, to low and medium up the sequence. The uppermost low and medium-vitrinite seams have a high phosphorus content (Fig. 21–17).

The small intracratonic Oaklands Basin contains a low-vitrinite, low-phosphorus seam.



LATE PERMIAN — BOWEN BASIN
Baralaba Coal Measures — Rangal Coal Measures
5A Southeast — **5B** Central — **5C** North
4 Burngrove Formation
3 Fairhill Formation
2 Moranbah Coal Measures — **1** German Creek Formation

15/A/488

Fig. 21–13. Vitrinite (% mmf) and phosphorus (% db) of Late Permian seams from the Bowen Basin.

Lateral Variation in Phosphorus Content

Palaeographic maps with lateral variation in phosphorus content (% db) have been constructed for one Early Permian and three Late Permian sequences (Table 21–1). These sequences have been chosen to coincide with major changes in other coal quality parameters (vitrinite and sulphur content) reflecting variations in depositional environments, based on the CSIRO data-base (see microfiches).

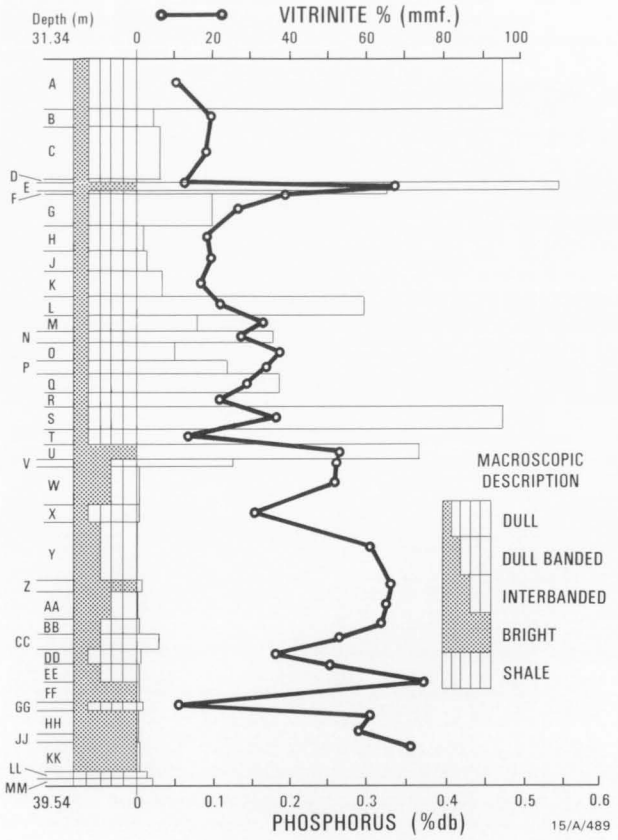


Fig. 21–14. Relationship between phosphorus (% db) and vitrinite (% mmf) of subsections of the Taurus seam in the Late Permian Rangal Coal Measures from the Blackwater area of the central Bowen Basin (CSIRO LR 328).

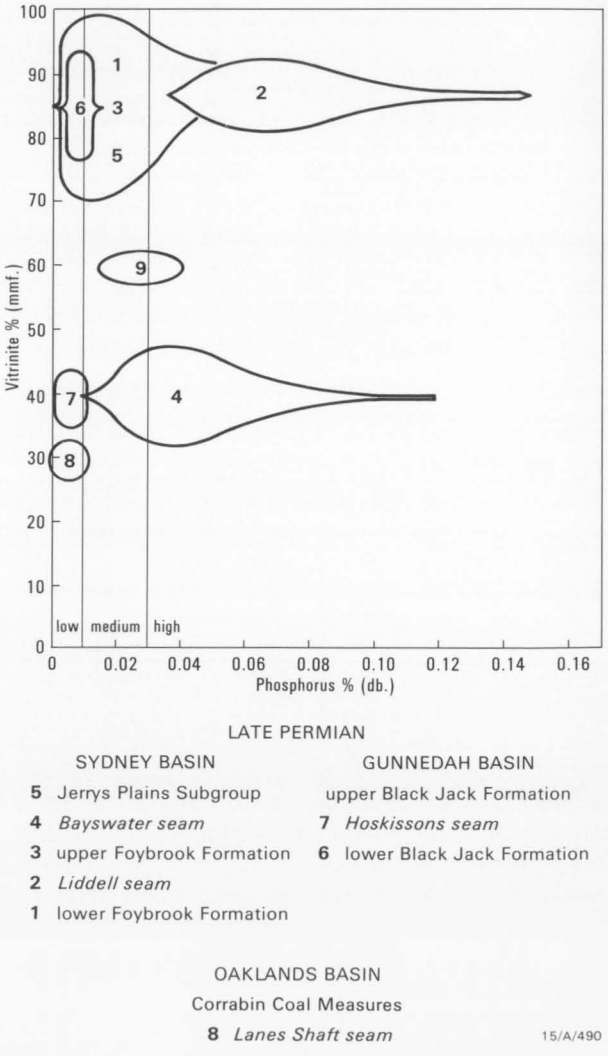
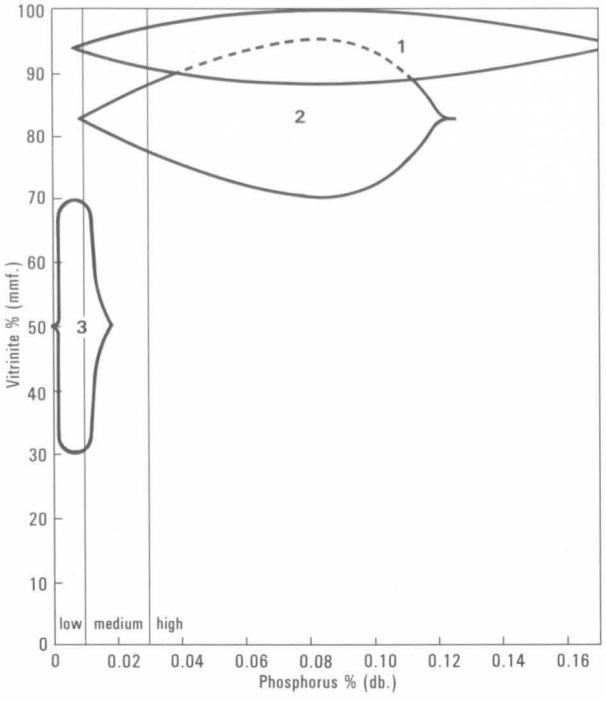


Fig. 21–15. Vitrinite (% mmf) and phosphorus (% db) of Late Permian seams from the northern Sydney, Oaklands and Gunnedah Basins.



LATE PERMIAN – SYDNEY BASIN

Northeast

Newcastle Coal Measures

3 *Upper seams*

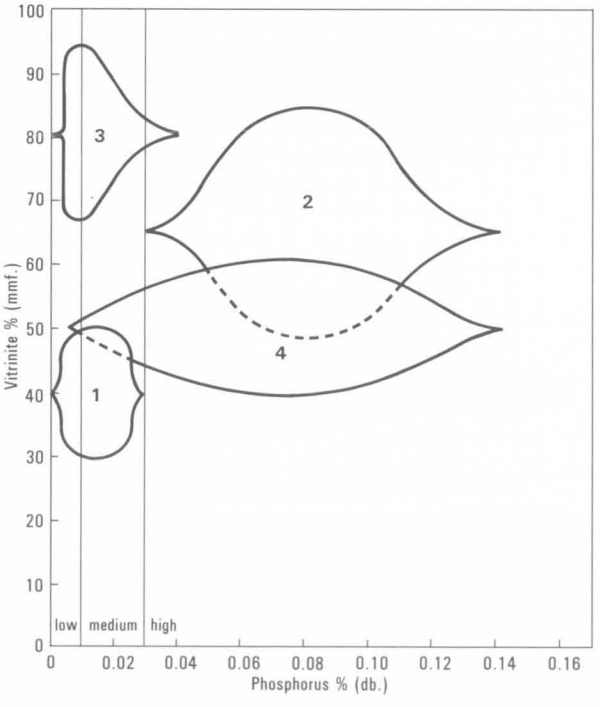
2 *Lower seams*

Tomago Coal Measures

1 *All seams*

15/A/491

Fig. 21–16. Vitrinite (% mmf) and phosphorus (% db) of Late Permian seams from the northeastern Sydney Basin.



LATE PERMIAN – SYDNEY BASIN

Illawarra Coal Measures

South		West
Bulli seam	4	*Katoomba seam*
Wongawilli seam	3	*Middle River seam*
Tongarra seam	2	*Irondale seam*
Woonona seam	1	*Lithgow seam*

15/A/492

Fig. 21–17. Vitrinite (% mmf) and phosphorus (% db) of Late Permian seams from the southern and western Sydney Basin.

Middle coal measures

The Early Permian coals have mainly medium to high phosphorus contents in both the Bowen (Fig. 21–18) and Sydney Basins (Fig. 21–19). Low and medium-phosphorus coals are found within the Blair Athol and Wolfang Basins (Fig. 21–12) adjacent to the Bowen Basin. In the Gunnedah Basin (Fig. 21–13), a seam in the southwest (probably stratigraphically equivalent to the base of the sequence in the east) is high in phosphorus, although the majority of seams in the thick northeastern sequence are low in phosphorus (Fig. 21–15).

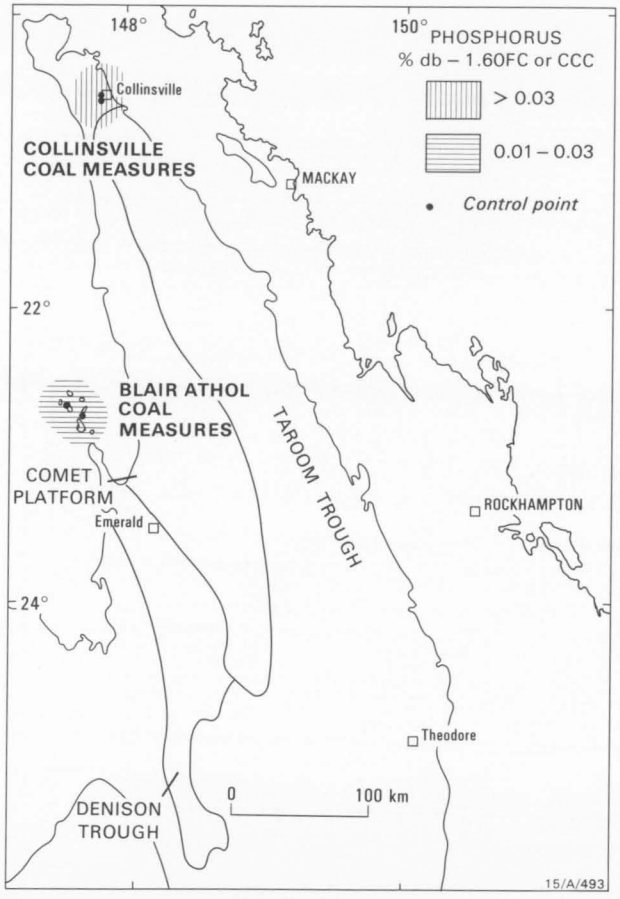


Fig. 21–18. Lateral variation in phosphorus content (% db–1.60FC or CCC) of middle coal measures from the Bowen, Blair Athol and Wolfang Basins.

Lower part of upper coal measures

Phosphorus content in the base of the Late Permian is shown in Figs 21–20 and 21. In the Bowen Basin, there is a transition from high-phosphorus in the German Creek Formation in the German Creek area to mainly medium-phosphorus in both the Moranbah Coal Measures northwards and German Creek Formation westwards (Fig. 21–20). In the Sydney, Gunnedah and Gloucester Basins, the phosphorus values exclude the Bayswater seam and correlatives throughout the three basins and the Liddell seam in the northern part of the Sydney Basin.

In the Sydney Basin, phosphorus is mainly high with a low-phosphorus coal (Tongarra seam) in the south, and medium to low-phosphorus coals in the north. The few data available indicate mainly low-phosphorus coals at the base of the Gunnedah Basin sequence (Fig. 21–25).

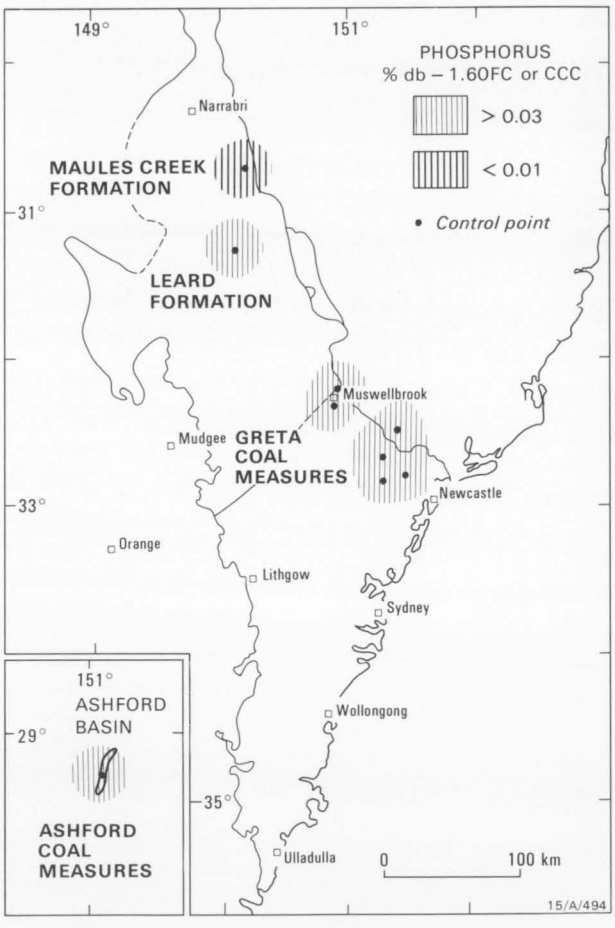


Fig. 21–19. Lateral variation in phosphorus content (% db–1.60FC or CCC) of middle coal measures from the Gunnedah, Sydney, Gloucester and Ashford Basins.

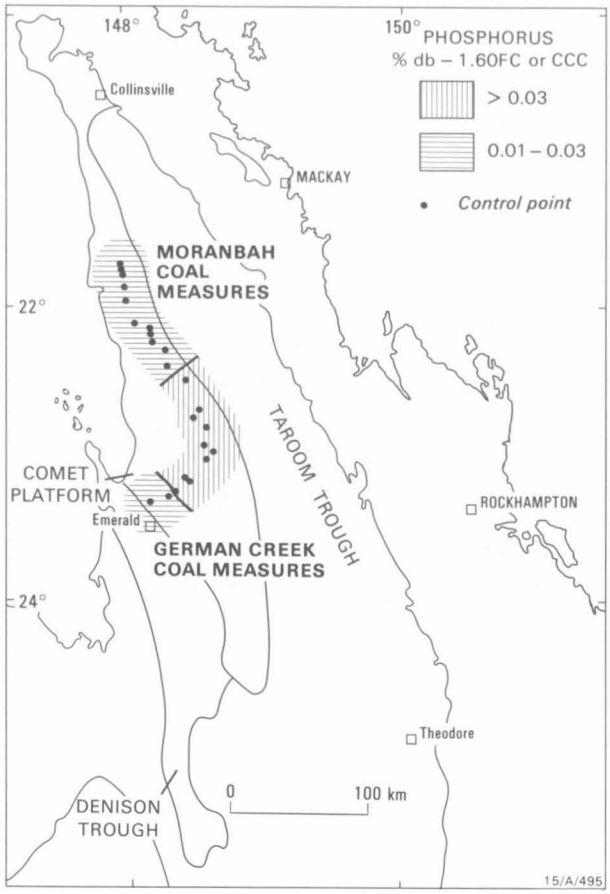


Fig. 21–20. Lateral variation in phosphorus content (% db–1.60FC or CCC) of lower part of upper coal measures from the Bowen Basin.

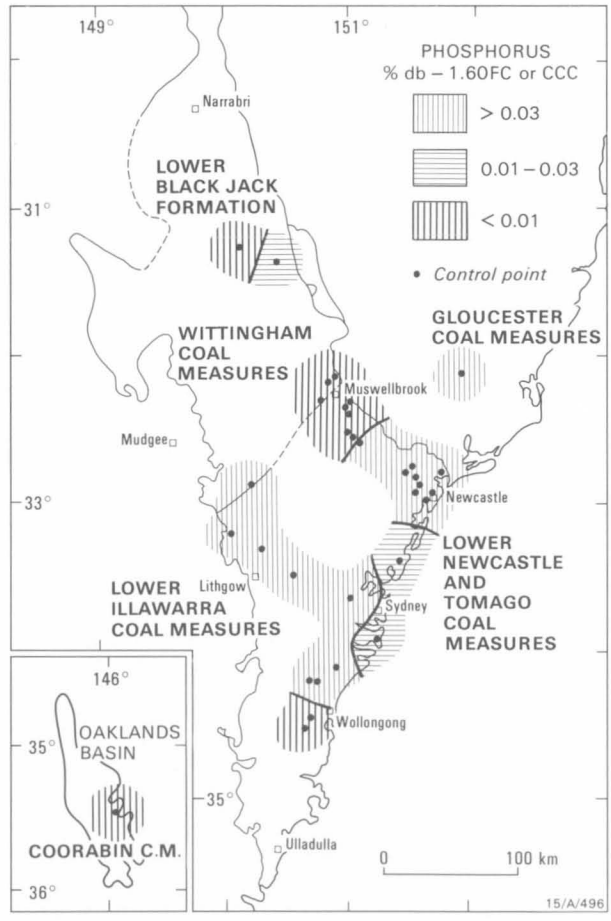


Fig. 21–21. Lateral variation in phosphorus content (% db–1.60FC or CCC) of lower part of upper coal measures from in the Gunnedah, Sydney, Gloucester and Oaklands Basins.

Bayswater seam horizon

Phosphorus content for the Bayswater seam horizon in the Sydney, Gunnedah and Gloucester Basins is low to medium (Fig. 21–22), except in the north of the Sydney Basin where some high-phosphorus sections are present.

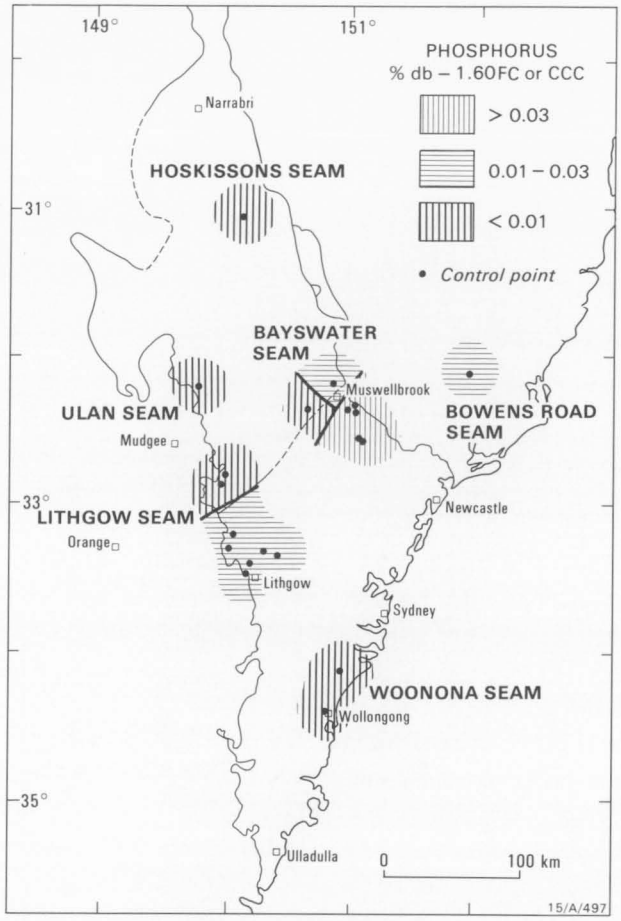


Fig. 21–22. Lateral variation in phosphorus content (% db–1.60FC or CCC) of Bayswater seam sequence in the Gunnedah, Gloucester and Sydney Basins.

Top part of upper coal measures

In the Bowen Basin, mainly high-phosphorus coals are located throughout and phosphorus content increases northwards. Some low to medium-phosphorus coals are present in the southeast, southwest and around Emerald (Fig. 21–23). Phosphorus is variable laterally in the Galilee Basin as based on the few available data (Fig. 21–24), although at each control point it remains fairly constant up the section (seams E to A-B).

In the Sydney Basin, chiefly high-phosphorus seams are found to the south and west, while mainly low-phosphorus coals are present in the northeast (Fig. 21–25). Two samples from the top of the Gunnedah Basin are low and high in phosphorus.

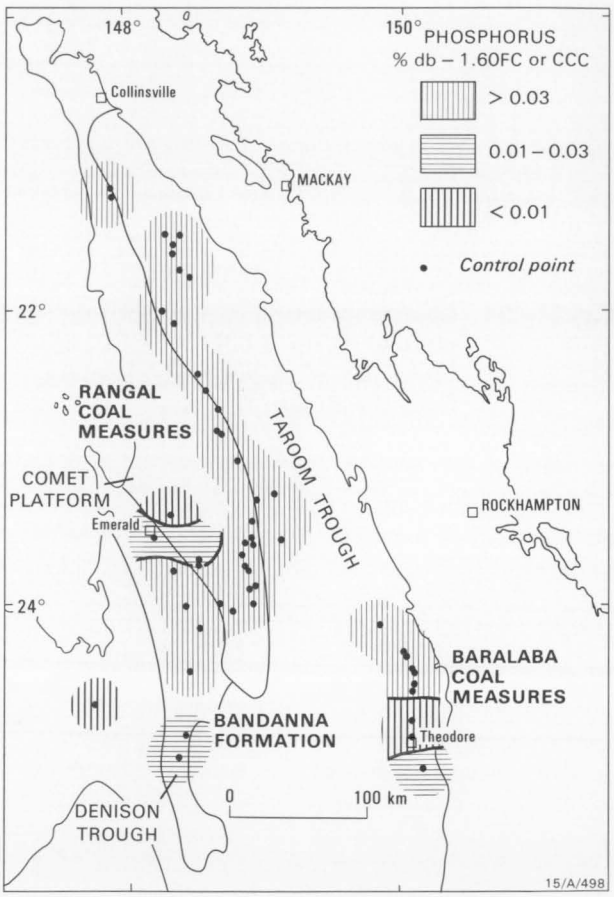


Fig. 21–23. Lateral variation in phosphorus content (% db–1.60FC or CCC) of top part of upper coal measures from the Bowen Basin.

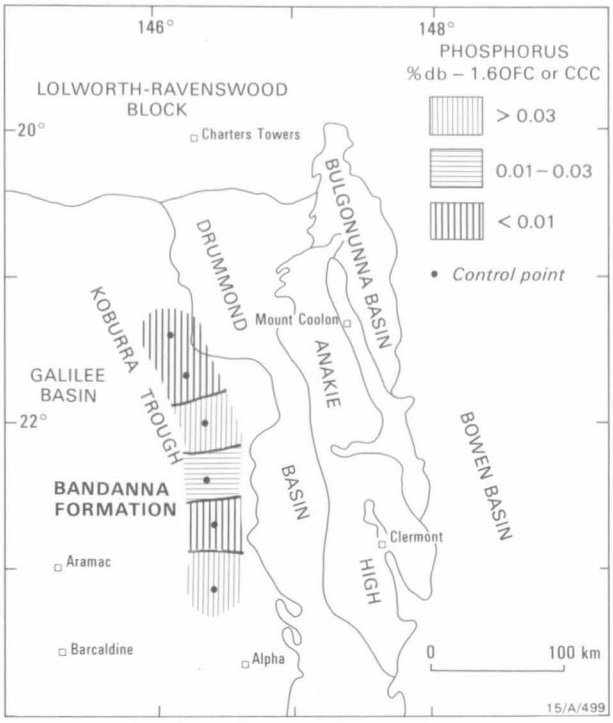


Fig. 21–24. Lateral variation in phosphorus content (% db–1.90FC) of top part of upper coal measures from in the Galilee Basin.

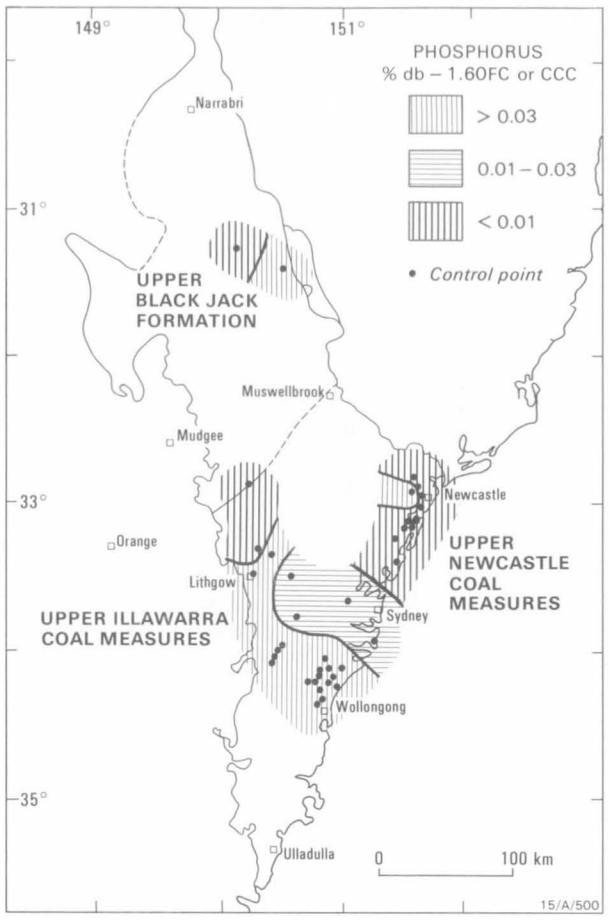


Fig. 21–25. Lateral variation in phosphorus content (% db–1.60FC or CCC) of top part of upper coal measures from the Gunnedah and Sydney Basins.

Conclusions

In the Early Permian, predominantly high-phosphorus coals were deposited in the Sydney and Bowen Basins with low-phosphorus coals in the Blair Athol, Wolfang and Gunnedah Basins. The lower part of the Late Permian sequence in the Bowen and Sydney Basins has mainly high-phosphorus seams, which grade vertically into medium-phosphorus seams in the middle of the sequence. Phosphorus content in the Bayswater seam horizon of the Sydney, Gunnedah and Gloucester Basins is prevalently low to medium. In the top of the Late Permian, high-phosphorus seams were deposited over much of the north and central Bowen Basins and the south and western Sydney Basin. Low-phosphorus coals are found across both the southern Bowen Basin and the northern Sydney Basin.

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CHAPTER 22

Ash Content and Composition of the Permian Coals

by
J.W. Hunt

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Introduction

Ash of coal is of primary importance in coal utilization. Many end-uses (e.g., coking, hydrogenation) are designed for coals with specific ash composition and content, and in many cases some beneficiation treatment of the coal is required to meet specifications. Alternatively, particular end-uses may be designed to accommodate the in situash characteristics of the coal (e.g., power generation), provided the variability is within required limits.

The amount, composition and distribution of ash in coal are determined principally by processes within the initial peat-forming environment. In the Australian Permian basins (Fig. 22–1), material introduced by aerial (volcanic) and aqueous processes, and secondary redistribution of some components considerably complicates the correlation of the ash content of coals with the original depositional environment. This is particularly true, as routinely obtained data do not discriminate between the possible origin and history of mineral matter in coal. However, because of the large amount of information available, the distribution of ash content and composition have been outlined in this chapter, although an understanding of regional geological controls is poor.

Ash Content

Ash content determined by thermal decomposition is one of the parameters invariably reported in coal analyses, because of the diluting effect of ash on coal properties related to organic constituents (calorific value and volatile matter), and because the commercial penalty which must be paid in order to transport, export or locally utilize these high-ash coals.

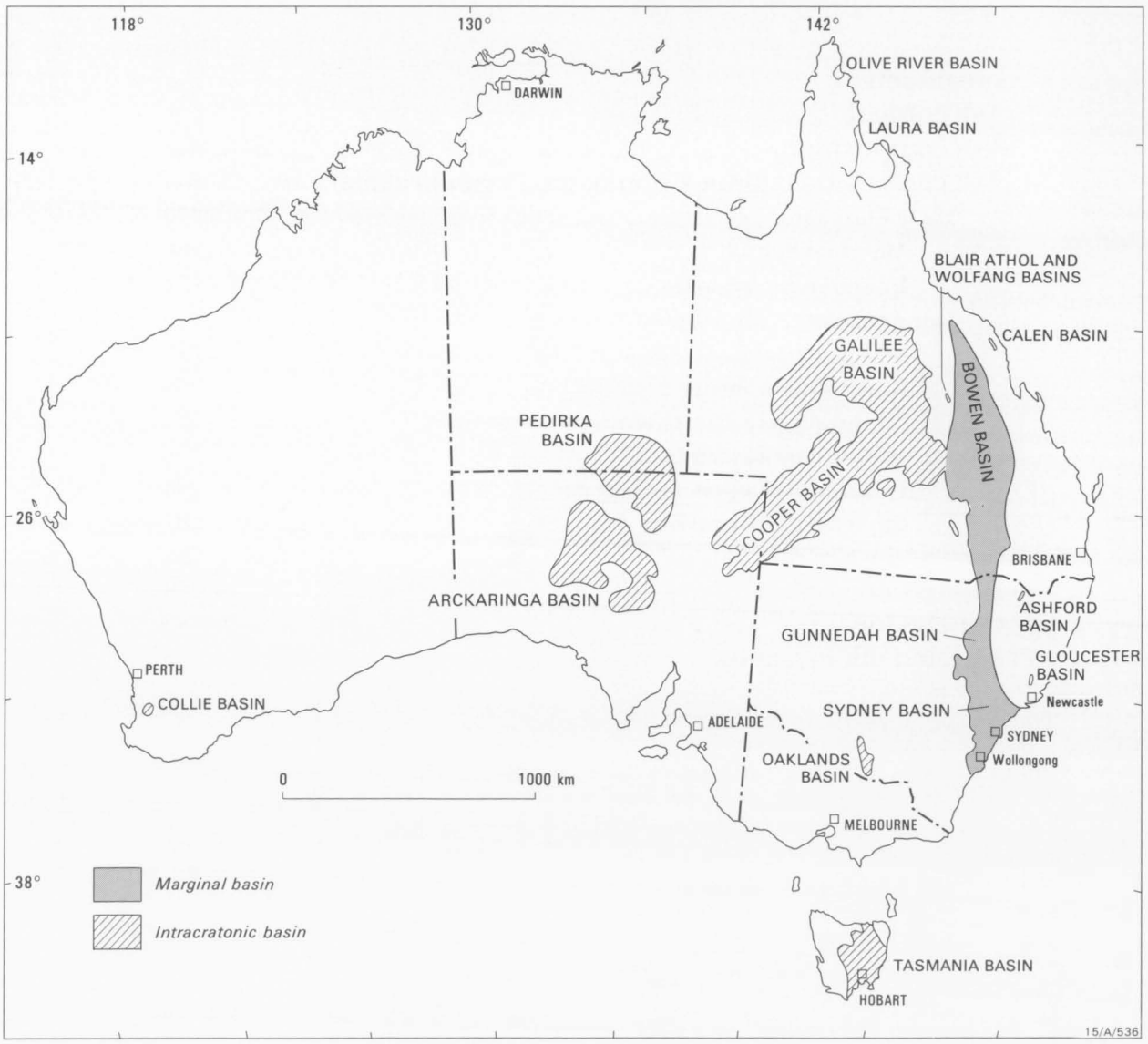


Fig. 22–1. Location of the Australian Permian coal basins.

Mineral matter in coal is commonly divided into primary (or inherent), secondary (or adventitious) and tertiary categories. Tertiary mineral matter, formed chemically after the origin of the coal, is present only in small amounts and is not considered further here. Primary mineral matter is intimately associated with the organic part of the coal, and assumed to originate (in vitrite at least) from inorganic material fixed in the original peat or coal-forming plants. Primary mineral matter may be concentrated by oxidation in inertinite-rich coals and by volumetric reduction of the organic parts of the coal. Primary mineral matter can usually only be removed from coal after grinding to a fine size.

Secondary mineral matter is present as discrete, macroscopically visible lenses or bands of aqueously introduced material, and in Australian Permian coals, as air-borne introduced tuffaceous material. Secondary mineral matter can be removed by mechanical treatment, such as crushing and density separation; the degree of liberation depending on the grain size after crushing and distribution of the matter. Washability data, based on the percentage-recovery and ash content at various separation densities, are a more recent and widely reported analysis, used to characterise the distribution and content of mineral matter in coal.

As a result of the wide variety, age and quality of data reviewed in this chapter, it has not been possible to treat the forms of mineral matter in detail. Instead, the inherent mineral matter has been estimated, using ash content of either clean coal composites (CCC) or 1.60 relative density float fraction composites (1.60FC). Clean coal composites generally comprise the coal minus any mineral matter sections greater than 5 or 10 mm in thickness. Sometimes X-radiography is used in discriminating between low-ash and high-ash carbonaceous material, and further subsections may be removed from a clean coal composite on this basis. Where a clean coal composite is calculated from subsection analyses, any sections with more than 35% mineral matter (by weight), i.e., "dirt bands", are also excluded.

The portion of a coal seam recovered as "floats" from a 1.60RD medium is approximately equivalent to a clean coal composite, in that any discrete mineral matter bands depending on the crushing sizings are removed from consideration. Analyses of the 1.60FC is commonly reported by geologists during reconnaissance work. In cases where other density separations are reported –1.90FC in the Galilee basin or 1.45FC for coking fractions, it has been possible to estimate the ash content for the 1.60C where sufficient washability data are available for interpolation.

Throughout this chapter, ash content is referred to using the following levels: (a) low 5–10% (db), (b) medium 10–15% (db), (c) high 15–20% (db) and (d) very high 20% (db).

The data were calculated to a dry basis (db) to account for the diluting effect of seam moisture, which may be significant between basins, depending on the maturity (rank) of the coal. The categories are arbitrary and designed to cover the majority of ash contents encountered. Some overlap has been allowed at the boundaries of the categories to determine lateral distribution discussed below.

Ash Composition

The chemical composition of coal ash directly relates to the composition of minerals in the coal. Both silicon and aluminium are major components of coal ash, which is usually reported as oxides. The SiO_2/Al_2O_3 mole ratio (called the $Si0_2/A1_20_3$ ratio here) is often constant and characteristic for particular seams (Shibaoka, 1972), reflecting the mineral species present during the deposition of the peat. Although the absolute proportion of $Si0_2$ or $A1_20_3$ in coal ash may undergo change due to secondary mineralisation, the $Si0_2/A1_20_3$ ratio does not. In this chapter, coal ash composition is presented in tertiary form, showing the ratio of $Si0_2$ + $A1_20_3$ to other oxides, and the ratio of $Si0_2$ to $A1_20_3$ (Fig. 22–2). The $Si0_2/A1_20_3$ ratio is characterised as (a) very low <2.0, (b) low 2.0–3.0, (c) medium 3.0–4.0, (d) low to medium 2.0–4.0, and (e) high >4.0. The categories conveniently coincide with the main range of values observed for the Permian coals.

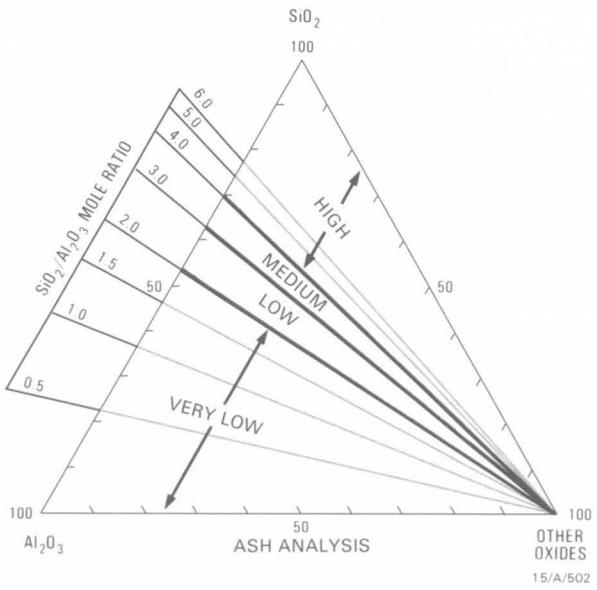


Fig. 22–2. Ash composition diagram showing the division into high, medium, low and very low $Si0_2/A1_20_3$ Mole Ratios.

The relationship between composition of ash for raw coal (RC) samples and 1.60F samples was investigated using data of the Geological Survey of Queensland for samples from the same geographical area. Samples from the German Creek

Formation in the Bowen Basin (predominantly the German Creek seam) showed a reduction in other oxides (mainly Fe from pyrite) for 1.60F samples, but no significant change in the SiO_2/Al_2O_3 ratio (Fig. 22–3). Ash for the raw coal samples ranged from about 10 to 40% and, for the 1.60F samples from 8 to 10%. Samples from the Rangal Coal Measures showed a small decrease in other oxides as well as a small decrease in the SiO_2/Al_2O_3 ratio in the 1.60F samples (Fig. 22–4). The change was not enough to invalidate the categorisations made here. Shibaoka (1972) also found that the SiO_2/Al_2O_3 ratio was largely independent of ash yield (and therefore primary or secondary mineral matter).

Shibaoka (1972) related the SiO_2/Al_2O_3 ratio in coal ash to the proportion of quartz and clay in the ash, by X-ray analsysis of low-temperature ashes. Shibaoka's results, with data from Ward (1978), show a good correlation between the SiO_2/Al_2O_3 ratio and quartz/clay ratio (Fig. 22–5). Quartz in coal may be either primary or secondary in origin, but the primary type usually greater than 20 or 30μm diameter, are not abundant in coal.

On the other hand, fine-grained (probably secondary) silica has proved to be ubiquitous throughout many of the uneconomic areas of the Permian coal measures and seemingly is the main form in most seams which have high SiO_2/Al_2O_3 ratios.

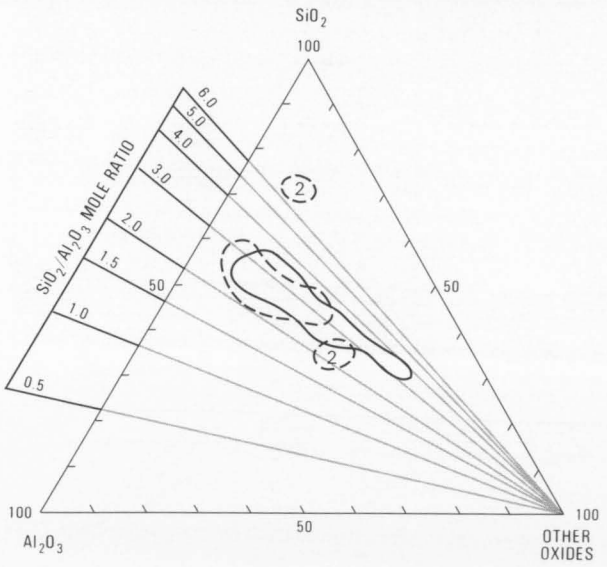


Fig 22–3. Composition of ash from raw coal composites compared with 1.60 relative density float fraction composites or clean coal composites of seams in the Late Permian German Creek Formation.

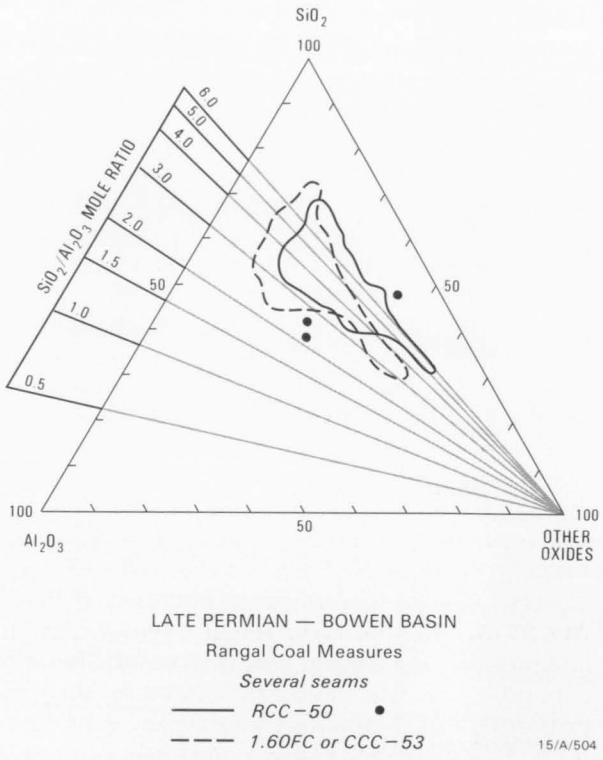


Fig. 22–4. Composition of ash from raw coal composites (RCC) compared with 1.60 relative density float fraction composites (1.60FC) or clean coal composites (CCC) of seams in the Rangal Coal Measures.

Ash Content and Composition in the Permian Coals

In the following section, ash content and composition is reviewed by basin and age, and fine-scaled vertical variations apparent in these two variables are briefly mentioned. Table 22–1 provides a simplified correlation of the coal-bearing units discussed.

Early Permian

Marginal basins

Bowen Basin. The Bowen Basin contains Early Permian coal measures at two horizons. Few data relating to the amount and composition of ash are available for the lower coal-bearing sequence in the Reids Dome beds, which were deposited early in the Early Permian. The upper coal-bearing unit,

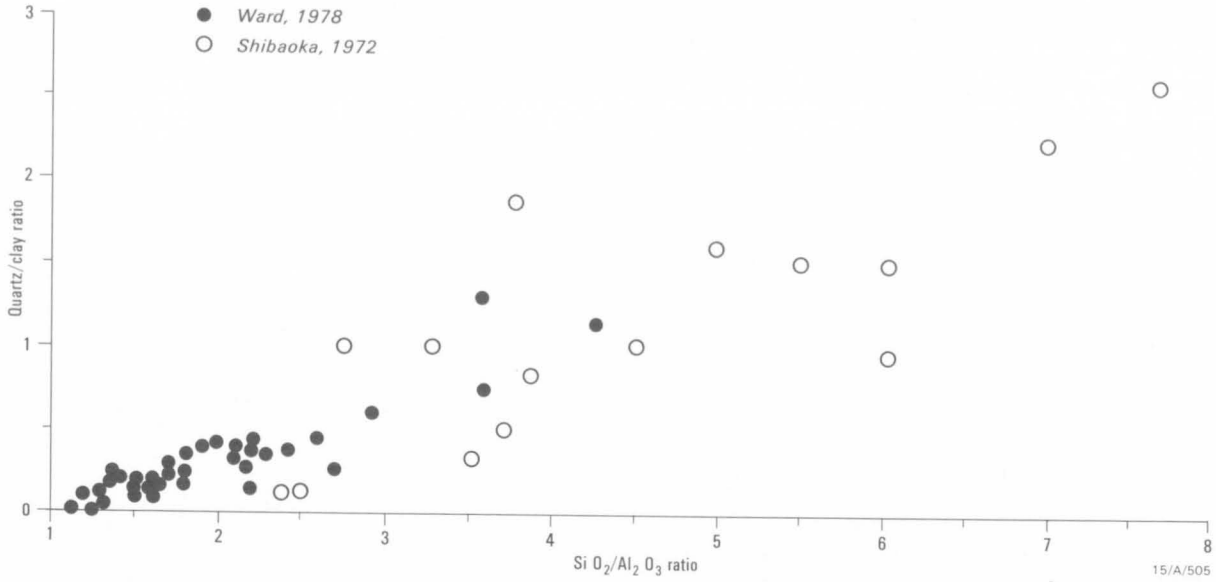
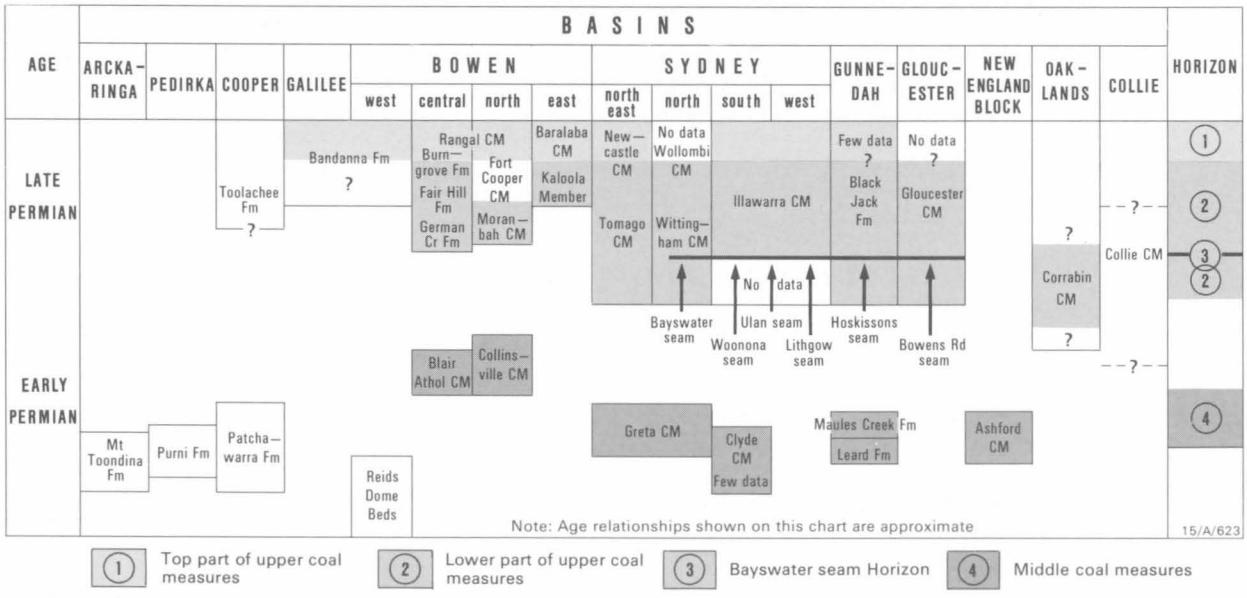


Fig. 22–5. Relationship between the ratio $Si0_2/A1_20_3$ in the ash, and the ratio of quartz to clay in the coal.

TABLE 22–1. SIMPLIFIED CORRELATION CHART FOR THE PERMIAN COAL BASINS, SHOWING HORIZONS USED IN THE PALAEOGEOGRAPHIC RECONSTRUCTIONS



including the Collinsville Coal Measures and equivalents in the Back Creek Group along the northwestern margin of the basin, was formed late in the Early Permian.

Ash of the Collinsville Coal Measures at Collinsville is generally medium to high. Farther south, Collinsville Coal Measures' equivalents in the Back Creek Group at Rugby and Emerald generally have a high to very high ash content.

At Collinsville, the $Si0_2/A1_20_3$ ratio in the ash is low to medium (Fig. 22–6) and no vertical or lateral trends in the ratio are apparent.

Gunnedah Basin. Limited data are available for Early Permian seams in Leard and Maules Creek Formations of the Gunnedah Basin.

Seams in the Leard Formation and its equivalents generally are high to very high in ash (RCC's). Coals in the overlying Maules Creek Formation in the northeast usually have a low ash content (1.60FC's). The ash from Maules Creek Formation equivalents at Wingen in the south, is mainly low (RCC's).

Seams in the Leard Formation, and its probable equivalents at the base of the northeastern sequence, have typically low to very low $Si0_2/A1_20_3$ ratios in the ash (Fig. 22–6). Data for the Maules Creek Formation in the northeast show extremely variable $Si0_2/A1_20_3$ ratios (Fig. 22–7), probably biased because of the presence of secondary silica in many samples.

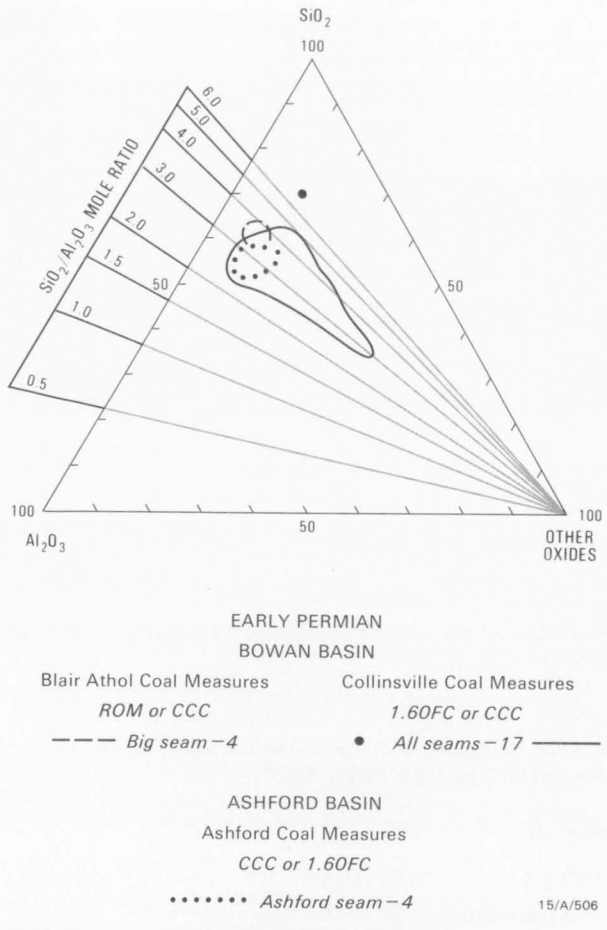


Fig. 22–6. Composition of ash from seams (1.60FC or CCC) in the Early Permian Collinsville, Blair Athol and Ashford Coal Measures from the northern Bowen, Blair Athol and Ashford Basins.

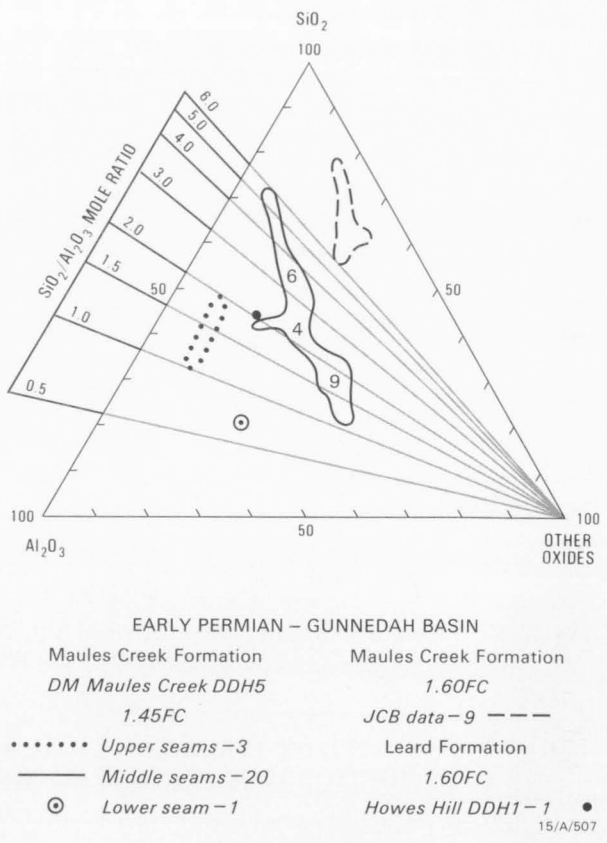


Fig. 22–7. Composition of ash from seams (1.45FC, 1.60FC or RCC) in the Early Permian Leard and Maules Formations from the Gunnedah Basin.

Sydney Basin. Data are available for the Early Permian Greta Coal Measures at Cessnock, Muswellbrook and Glendonbrook in the north of the Sydney Basin and the Clyde Coal Measures in the south.

The Greta Coal Measures at Cessnock, Muswellbrook and Glendonbrook have typically low and some medium-ash coals. Coals in the Greta Coal Measures from the Loder Dome bore and East Maitland bore, respectively west and east of Cessnock, show predominantly medium ash contents.

The SiO_2/Al_2O_3 ratio at Cessnock is chiefly low, decreasing up the sequence (Fig. 22–8), and the high proportion of other oxides in the top of the Greta seam is due to secondary pyrites. At Muswellbrook, the SiO_2/Al_2O_3 ratio is mainly low in the basal seams, and ranges from medium to high in the upper seams (Fig. 22–7). The Tangorin seam at Glendonbrook has the lowest SiO_2/Al_2O_3 ratio of any of the Permian coals (Fig. 22–8).

A single seam analysed from the Clyde Coal Measures in the south of the Sydney Basin has a very high ash content (Cook & Read, 1968).

Intracratonic basins

Blair Athol and Wolfang Basins. The Blair Athol and Wolfang Basins are located in the axial trend of the Denison Trough, west of the Bowen Basin. The Big seam, a 30 m-thick seam in the Blair Athol Coal Measures in the Blair Athol Basin, and its equivalent in the Wolfang Basin, are typically low in ash. Underlying thin seams in the Wolfang Basin have a high ash content, and a single overlying thin seam is low in ash. The SiO_2/Al_2O_3 ratio for the Big seam of the Blair Athol Basin is medium (Fig. 22–6).

Ashford Basin. The Ashford Coal Measures are located within the orogenic New England Fold Belt east of the Gunnedah Basin and north of the Sydney Basin. The few available data show principally low ash contents of the Ashford seam, with the SiO_2/Al_2O_3 ratio being usually low (Fig. 22–7).

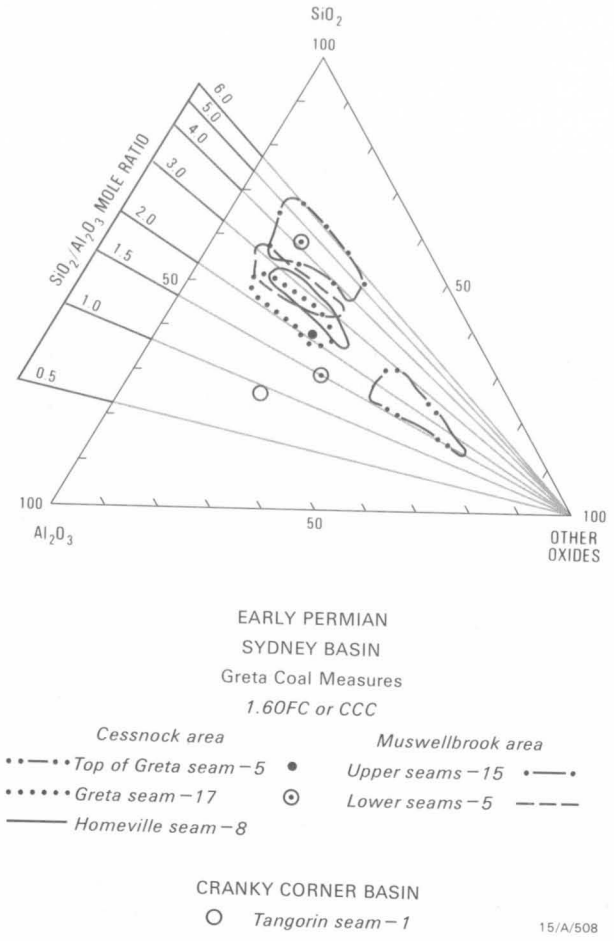


Fig. 22–8. Composition of ash from seams (1.60FC or CCC) in the Early Permian Greta Coal Measures from the Cessnock and Muswellbrook areas of the Sydney Basin, and from the Cranky Corner Basin.

Late Permian

Marginal basins

Bowen Basin. Potentially economic coal facies were developed in the Bowen Basin throughout the Late Permian. However, the frequency and thickness of widespread tuff bands in the middle of the sequence has precluded many coals from being economically viable. The early Late Permian German Creek Formation is overlain by the marine MacMillan Formation, which interfingers with the partly laterally equivalent Moranbah Coal Measures. They, in turn, are overlain in most of the basin by the uneconomic coal-bearing Fair Hill and Burngrove Formations or Fort Cooper Coal Measures. Later in the Late Permian, economic coal facies were developed in most of the basin. They are the Rangal Coal Measures in the north and south, the Baralaba Coal Measures in the east, and the Bandanna Formation in the west (Table 22–1).

The German Creek Formation contains typically low-ash coals with characteristically low to medium SiO_2/Al_2O_3 ratios (Fig. 22–9). The high proportion of other oxides is primarily due to pyrites. The Moranbah Coal Measures have low to medium ash coals with mainly low to medium SiO_2/Al_2O_3 ratios (Fig. 22–9).

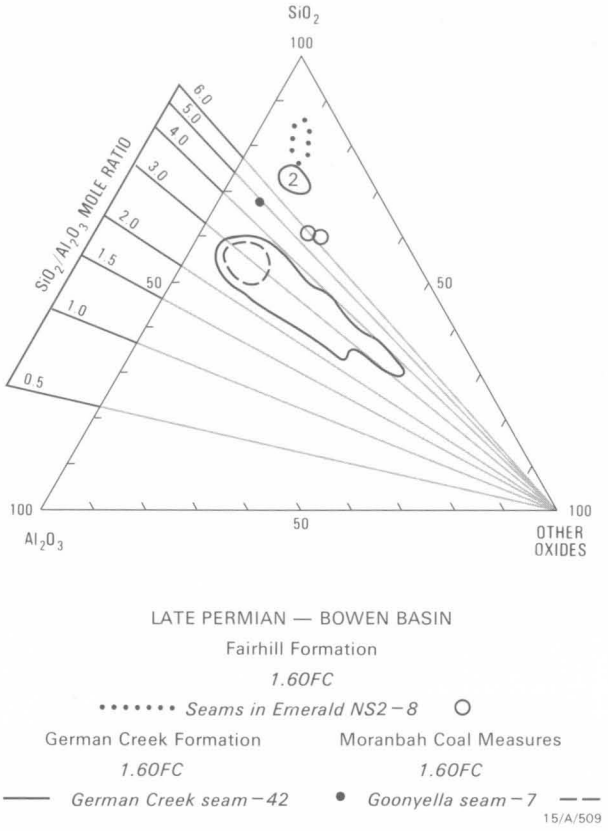


Fig. 22–9. Composition of ash from seams (1.60FC, CCC or RCC) in the Late Permian German Formation and Moranbah Coal Measures from the northern Bowen Basin.

The Fair Hill Formation, sampled in the bore Emerald NS2 in the Emerald area, have high-ash coals throughout owing to the abundance of interbedded tuffaceous material and associated secondary silica; the latter accounting for the high SiO_2/Al_2O_3 ratio in the 1.60F seam subsections (Fig. 22–9).

The overlying Burngrove Formation in most of the basin and Kaloola Member in the southeast also have high-ash coals with high SiO_2/Al_2O_3 ratios (Figs. 22–10 and 11), likewise probably the result of the abundance of interbedded tuffaceous material.

Ash content in the Rangal Coal Measures ranges from low to high in the north and low to medium in the central Bowen Basin. The Baralaba Coal Measures in the southeast and Bandanna Formation in the southwest have chiefly low-ash seams.

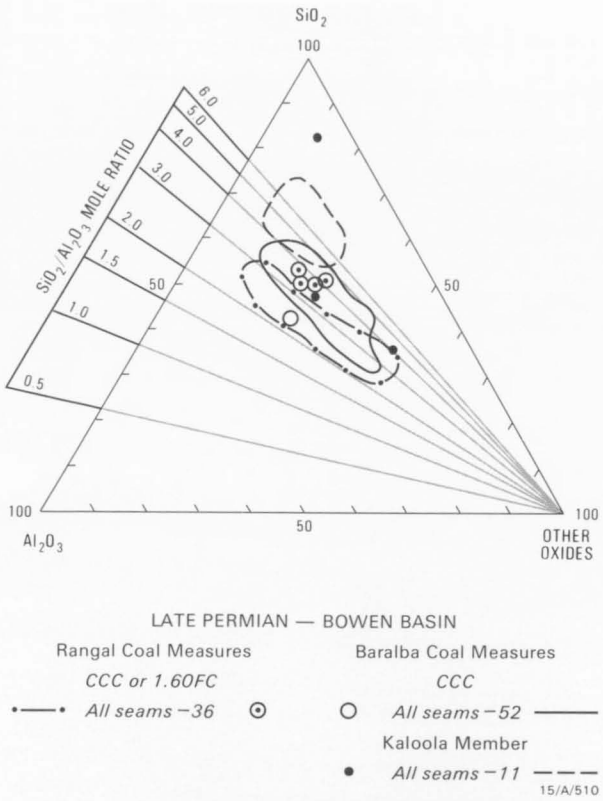


Fig. 22–10. Composition of ash from seams (1.60FC, or CCC) in the Baralaba and Rangal Coal Measures from the southeastern and northern Bowen Basin.

The $Si0_2/A1_20_3$ ratio for the Rangal Coal Measures is variable, ranging from low to medium in the north (Fig. 22–10) and low to high in the south (Fig. 22–11). In the Baralaba Coal Measures, the $Si0_2/A1_20_3$ ratio is typically low to medium (Fig. 22–10) and decreases up the sequence (Shibaoka, 1972). The $Si0_2/A1_20_3$ ratio for the Bandanna Formation in the west of the Bowen Basin is medium to high (Fig. 22–11).

Gunnedah Basin. Only limited data are available for seams in the Black Jack Formation in the Gunnedah Basin. The lower seams (beneath the Hoskissons) have predominantly medium ash contents with low to medium $Si0_2/A1_20_3$ ratios (Fig. 22–12). The Hoskissons seam is typically high in ash and has a low to medium $Si0_2/A1_20_3$ ratio. The upper seams in the Black Jack Formation show high ash contents with high $Si0_2/A1_20_3$ ratios, probably due to large amounts of fine-grained secondary silica.

Sydney Basin. Coal-bearing facies were deposited in the Sydney Basin during the whole of Late Permian. In the northeast, around Newcastle, the Tomago and overlying Newcastle Coal Measures contain predominantly economic coal throughout, with two exceptions: a barren interval in the middle of the former and the uneconomic tuff-banded coals in the middle of the latter. Their equivalent in the Upper Hunter Valley to the north are the Wittingham and overlying Wollombi Coal Measures; the latter are often highly tuff-banded and uneconomic. In the south and west of the Sydney Basin, the Illawarra Coal Measures have equivalents of the northern sequence (Table 22–1).

The Tomago Coal Measures in the northeast have chiefly medium to high-ash coals with low to high $SiO_2/A1_20_3$ ratios (Fig. 22–13). The overlying Newcastle Coal Measures also contain medium to high-ash coals throughout. The $SiO_2/A1_20_3$ ratios is mainly high at the base (with the exception of the lowermost seam, the Borehole) and mainly low to medium at the top (Fig. 22–13). Shibaoka (1972) has shown gradually increasing, then decreasing, $SiO_2/A1_20_3$ ratios vertically through the Newcastle Coal Measures.

The lowermost economic horizon of the Illawarra Coal Measures in the south and west (the Woonona, Lithgow and Ulan seams) has a medium to high ash content and a $SiO_2/A1_20_3$ ratio from low to high (Fig. 22–14). The lower overlying

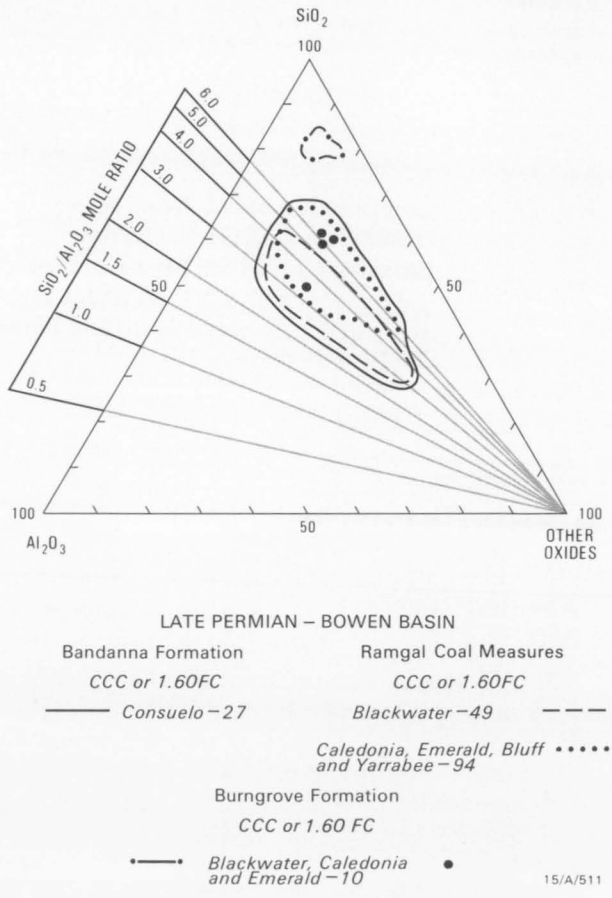


Fig. 22–11. Composition of ash from seams (1.60FC or CCC) in the Rangal Coal Measures and the Bandanna and Burngrove Formations from the central and southwestern Bowen Basin.

seams show a medium to very high ash content with a generally high SiO_2/Al_2O_3 (Fig. 22–14). The uppermost seam (Bulli in the south and Katoomba in the west) has a chiefly medium ash content with a mainly low to medium SiO_2/Al_2O_3 ratio (Fig. 22–14).

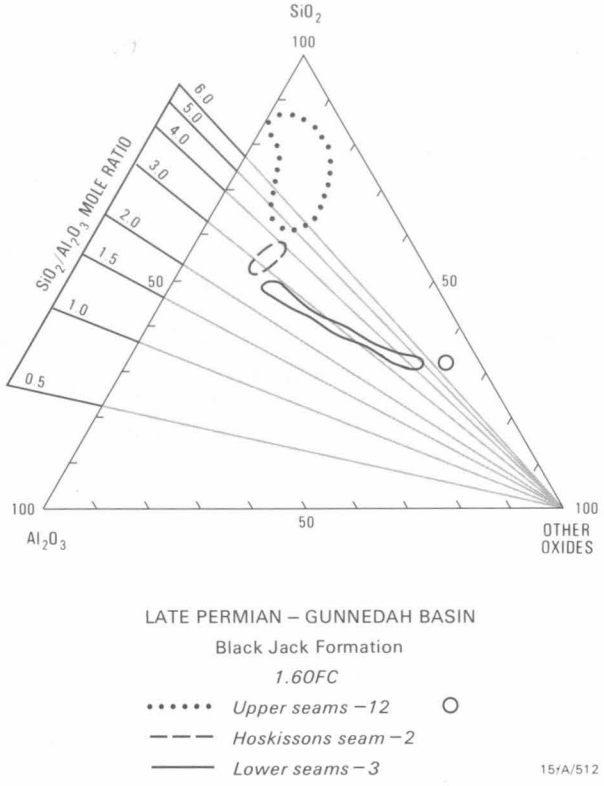


Fig. 22–12. Composition of ash from seams (1.60FC or CCC) in the Late Permian Black Jack formation from the Gunnedah Basin.

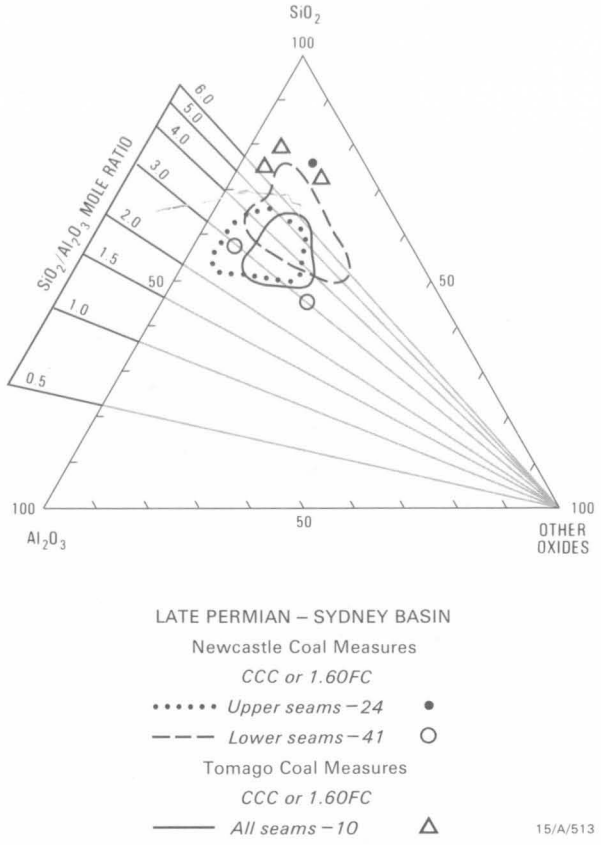


Fig. 22–13. Composition of ash from seams (1.60FC or CCC) in the Late Permian Tomago and Newcastle Coal Measures from the northeastern Sydney Basin.

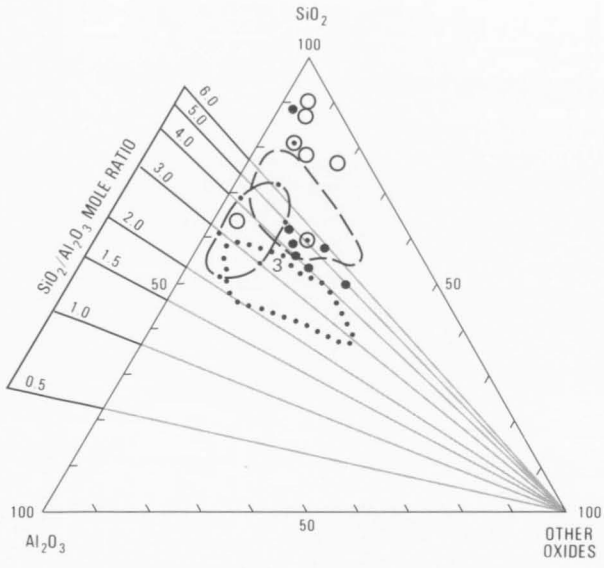
The basal seams of the northern sequence in the Foybrook Formation have typically low to medium-ash seams, usually with a high SiO_2/Al_2O_3 (Fig 22–15). The overlying Bayswater seam, which has a predominantly high ash content, shows a very variable SiO_2/Al_2O_3 ratio (Fig. 22–15). Seams in the overlying Jerrys Plains Sub-group contain chiefly medium to high-ash coals, with medium to high SiO_2/Al_2O_3 ratios. Fine-grained, secondary silica may account for the variable SiO_2/Al_2O_3 ratios of the northern sequence.

Gloucester Basin. The Gloucester Basin consists of an early Late Permian sequence of coals, petrographically similar to those of the Wittingham Coal Measures in the northern Sydney Basin. Based on the few available analyses, the sequence consists of low to high-ash coals (1.80FC), with medium SiO_2/Al_2O_3 ratios in the basal Avon Coal Measures and Bowen Road seam, and high SiO_2/Al_2O_3 ratios in the overlying Stratford Coal Measures (Fig. 22–15).

Intracratonic basins

Galilee basin. A thin sequence of Late Permian Coal Measures in the Bandanna Formation is exposed only along the eastern margin of the Galilee Basin, and analytical data are available for most of this outcrop. Ash content of 1.90F samples of seams in the Bandanna Formation is mainly medium to high, excluding the large amount of very high ash-carbonaceous material. Ash increases up the sequence. The lower seams have principally low to medium SiO_2/Al_2O_3 ratios, while the upper seams show high SiO_2/Al_2O_3 ratios (Fig. 22–16).

Oaklands basin. The Coorabin Coal Measures at the top of the Permian sequence in the Oaklands Basin have only a few seams and a few analytical data are available for the thick lower seam (Lanes Shaft seam). The seam has a medium to high ash content with a low SiO_2/Al_2O_3 ratio (Fig. 22–16).



LATE PERMIAN – SYDNEY BASIN

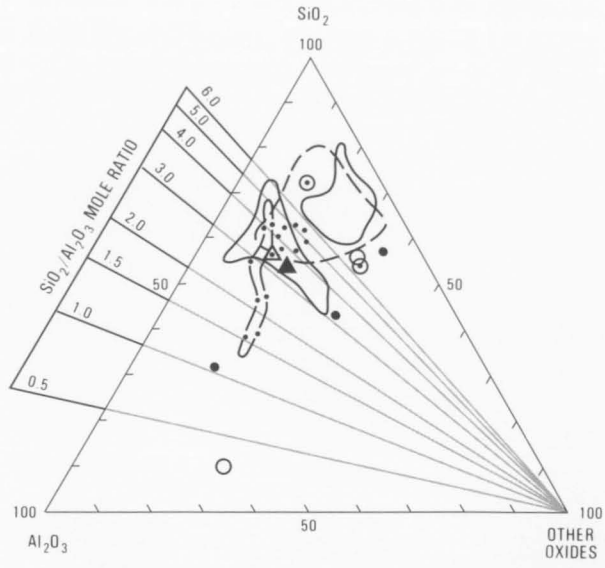
Illawarra Coal Measures

CCC

- ····· *Upper seams – 74* ●
- – – – *Lower seams – 51* ○
- •—• *Woonona, Lithgow and Ulan seams – 26* ⊙

15/A/514

Fig. 22–14. Composition of ash from seams (1.60FC or CCC) in the Late Permian Illawarra Coal Measures from the southern and western Sydney Basin.



LATE PERMIAN

SYDNEY BASIN		GLOUCESTER BASIN	
Singleton Coal Measures		Gloucester Coal Measures	
CCC or 1.60FC		*1.60FC*	
——— *Jerrys Plains Subgroup – 21*		*Stratford Subgroup – 4*	·····
•—• *Bayswater seam – 11*		*Bowens Road seam – 1*	◬
– – – *Foybrook Formation – 35*		*Avon Formation – 1*	▲

15/A/515

Fig. 22–15. Composition of ash from seams (1.60FC, 1.80FC or CCC) in the Late Permian Wittingham and Gloucester Coal Measures from the northern Sydney and Gloucester Basins.

Lateral Variation in Ash Content and Composition

In the following section, lateral regional-scale variation in ash content and composition is discussed for the four horizons in Table 22–1. Data with lateral variation of ash were compiled by estimating the average ash content and compositon of seams in the various intervals in Table 22–1, using the CSIRO data-base (see microfiches). In some cases, this may only be a single colliery sample, and in others represents a weighted average for several seams.

Middle coal measures

Variation in ash content for Early Permian coal measures is shown in Fig. 22–17 for the Bowen, Blair Athol and Wolfang Basins and in Fig. 22–18 for the Sydney, Gunnedah and Ashford Basins. A wide range of ash is apparent, although the economic seams have predominantly low ash contents in the Sydney Basin and low to medium in the Bowen Basin.

Variation in ash composition is shown in Fig. 22–19 for the Bowen Basin, and in Fig. 22–20 for the Sydney, Gunnedah and Ashford Basins. Low to medium $SiO_2/A1_2O_3$ ratios predominate, with the exception of the Maules Creek Formation in the northeast of the Gunnedah Basin and the Greta Coal Measures at Muswellbrook in the Sydney Basin.

Lower part of upper coal measures

Ash content of the early Late Permian sequence is provided in Fig. 22–21 for the Bowen Basin and in Fig. 22–22 for the Sydney, Gunnedah and Oaklands Basins. Ash content is low to medium in the Bowen Basin, and mainly high in the Sydney Basin and Gunnedah Basins, except for the currently mined areas in the north and northeast of the former. In the Oaklands Basin, ash content is medium. The areas of low to medium ash in the Bowen Basin coincide with low to medium $SiO_2/A1_2O_3$ ratios (Fig. 22–23). In the Sydney Basin, areas of high to very high ash generally coincide with high $SiO_2/A1_2O_3$ ratios (Fig. 22–24), while the

area of medium ash to the north coincides partly with the zone of medium SiO_2/Al_2O_3 ratios (Fig. 22–24).

The Oaklands basin contains a high-ash coal with a low SiO_2/Al_2O_3 ratio (Fig. 22–24).

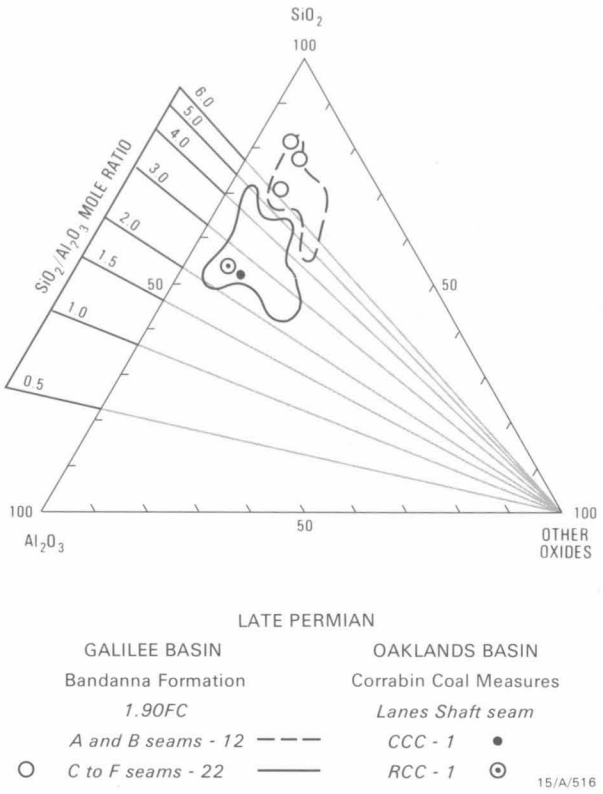


Fig. 22–16. Composition of ash from seams (1.90FC or CCC) in the Late Permian Bandanna Formation and Coorabin Coal Measures from the Galilee and Oaklands Basins.

Bayswater seam horizon

Although the Bayswater seam sequence in the Sydney, Gunnedah and Gloucester Basins is defined by its petrographically distinctive character (Chapter 19), ash content and composition are highly variable. Ash content is typically medium to high in the western Sydney Basin and Gunnedah Basin, and high to very high in the southern Sydney Basin and Gloucester Basin in the north (Fig. 22–25). The SiO_2/Al_2O_3 is mainly low to medium where the seams are mined in the west and north of the Sydney Basin, becoming medium to high towards the present coast (Fig. 22–26).

Top part of upper coal measures

Ash content in the late Late Permian sequence is usually medium in the northern Bowen Basin, medium to low in the centre, and low in the south and west (Fig. 22–27). In the Galilee Basin, ash content is variable both vertically and laterally, with a predominance of medium-ash coals. Ash content of the lower seams in the Galilee Basin (E and F) is shown in Fig. 22–28 and that of the upper seams (A and B) in Fig. 22–29.

The Gunnedah Basin contains chiefly very high-ash coals in the top, while the Sydney Basin has medium to high varieties (Fig. 22–30). The medium-ash coals are restricted mainly to the north and south of the Sydney Basin with a central zone of high-ash types.

In the Bowen Basin, there is strong association of low SiO_2/Al_2O_3 ratios with low to medium-ash coals in the north, and medium to high ratios with medium to low-ash coals in the south (Fig. 22–31). The Galilee Basin has mainly medium SiO_2/Al_2O_3 ratios in the lower seams (Fig. 22–32), and high ratios in the upper seams (Fig. 22–33), irrespective of ash content.

In the Gunnedah Basin one seam analysed from the upper high-ash portion of the coal measures exhibits a high SiO_2/Al_2O_3 ratio (Fig. 22–34). Low to medium SiO_2/Al_2O_3 ratios in the south of the Sydney Basin, coincide with chiefly medium ash contents. Throughout the northeast and west of the basin, mainly medium SiO_2/Al_2O_3 ratios are associated with high-ash coals (Fig. 22–34).

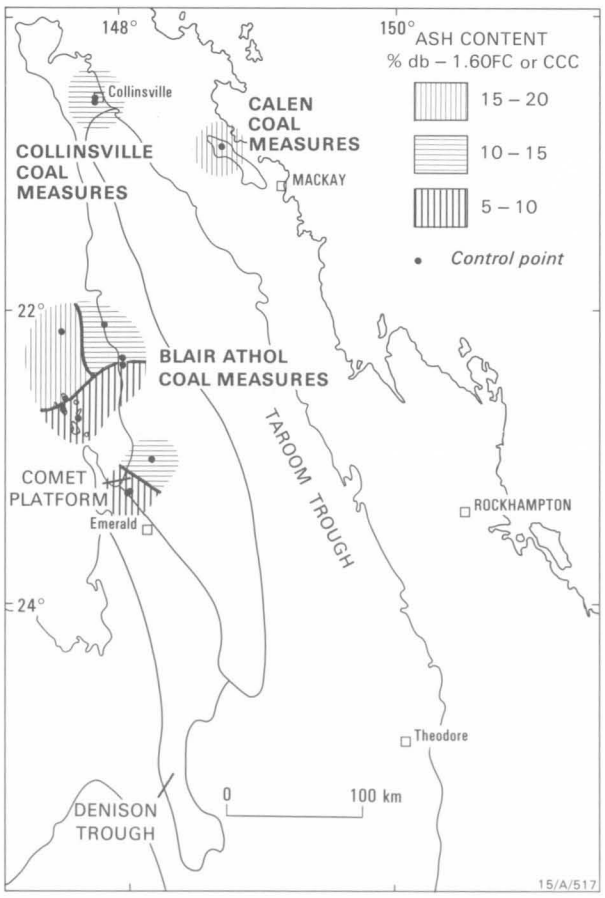


Fig. 22–17. Lateral variation of ash content (% db–1.60FC or CCC) in Early Permian seams from the Bowen, Blair Athol and Wolfang Basins.

Discussion

Ash content and composition of the Permian coals are variable both laterally and vertically throughout the Permian basins. Trends in the SiO_2/Al_2O_3 ratio, which are apparent in some of the Sydney Basin sequences (Shibaoka, 1972), are contradicted in other parts of the Sydney, Gunnedah, Galilee and Bowen Basins. However, leaving the Gunnedah and Galilee Basin aside, because of the sparse data of the former, and lack of adequate correlation in the latter, some broad generalisations can still be made of the SiO_2/Al_2O_3 ratio trends for the Sydney and Bowen Basins. Very low to low SiO_2/Al_2O_3 ratios are characteristic of many of the Early Permian coals. The base of the upper coal measures in both the Sydney and Bowen Basins also contain coals with low SiO_2/Al_2O_3 ratios, although the northern sequence in the Sydney Basin is highly variable probably because of secondary silica. Several deep bores in the Sydney Basin, analysed during the course of the project, indicated ubiquitious fine-grained, probably secondary silica throughout most of the upper coal measures; this material may be obscuring compositional trends reflecting the precursor's depositional environments.

Both the Sydney and Bowen Basins show a silica-rich phase in the middle of the Late Permian sequences, and in the latter, this coincides with markedly tuff-banded coals of the Fort Cooper Coal Measures, Burngrove Formation and Kaloola Member.

In the top of the Late Permian, coals with low to high SiO_2/Al_2O_3 ratio in the ash were located in both basins. The presence of low-ash seams, with medium to high SiO_2/Al_2O_3 ratios in the southern Bowen Basin, may indicate a depositional control.

In the northern Bowen Basin, the low SiO_2/Al_2O_3 ratios are associated with high-ash coals. However, in the southern Sydney Basin, low SiO_2/Al_2O_3 ratios are typical of medium-ash coals in the south, and medium to high SiO_2/Al_2O_3 ratios occur together with high-ash coals in the rest of the basin.

No consistent patterns in ash content (1.60FC and CCC) are observed in the basins, and the ash varies independently of coal type and original environment.

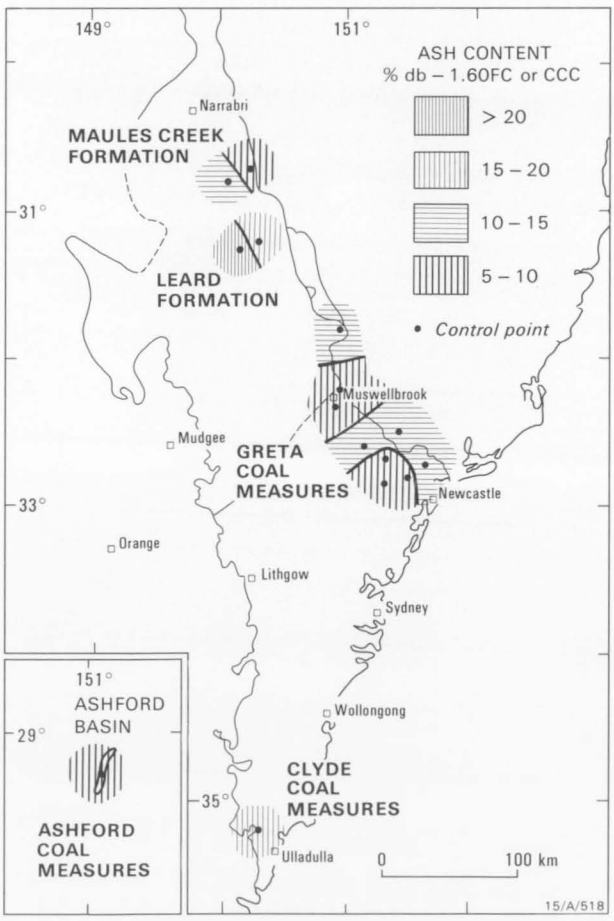


Fig. 22–18. Lateral variation of ash content (% db–1.60FC or CCC) in Early Permian seams from the Sydney, Gunnedah and Ashford Basins.

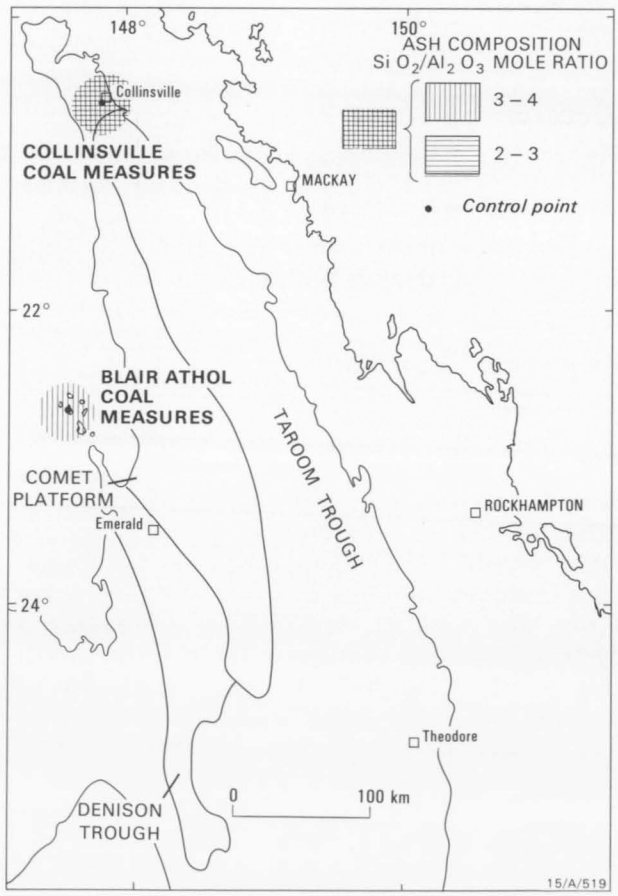


Fig. 22–19. Lateral variation of ash composition (1.60FC or CCC) for Early Permian seams from the Bowen and Blair Athol Basins.

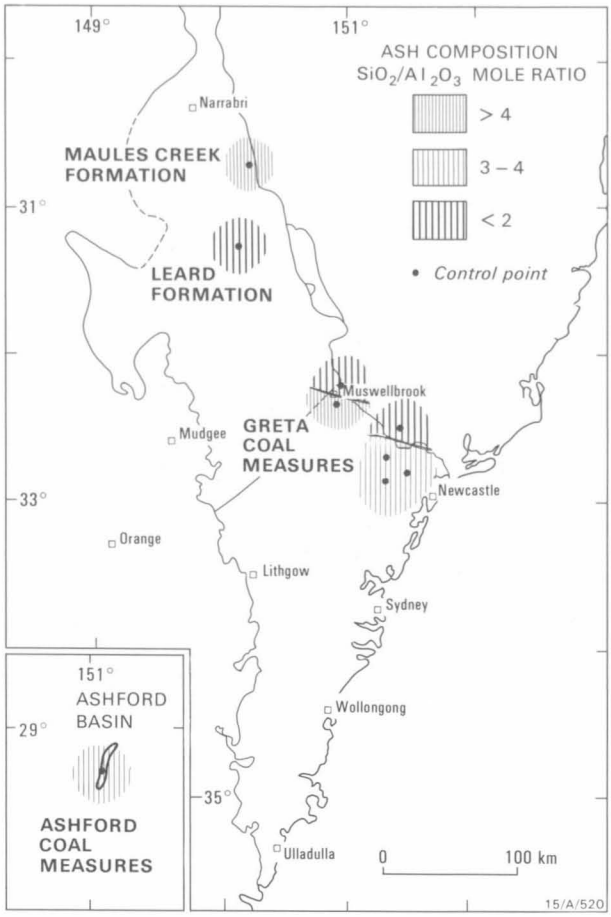


Fig. 22–20. Lateral variation of ash composition (1.60FC or CCC) for Early Permian seams from the Sydney, Gunnedah and Ashford Basins.

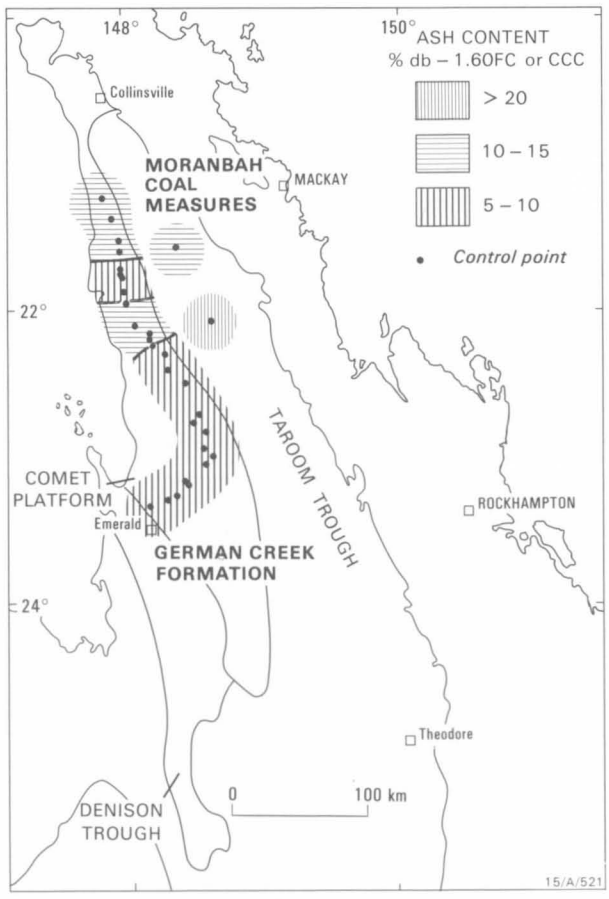


Fig. 22–21. Lateral variation of ash content (%db–CCC or 1.60FC) in lower part of upper coal measures from the Bowen Basin.

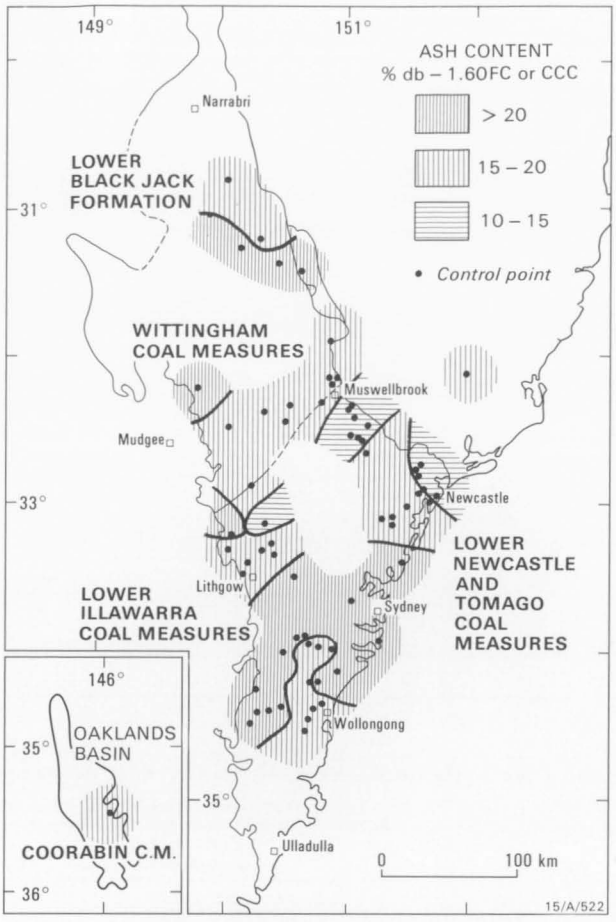


Fig. 22–22. Lateral variation of ash content (%db–CCC or 1.60FC) in lower part of upper coal measures from the Sydney, Gunnedah, Gloucester and Oaklands Basins.

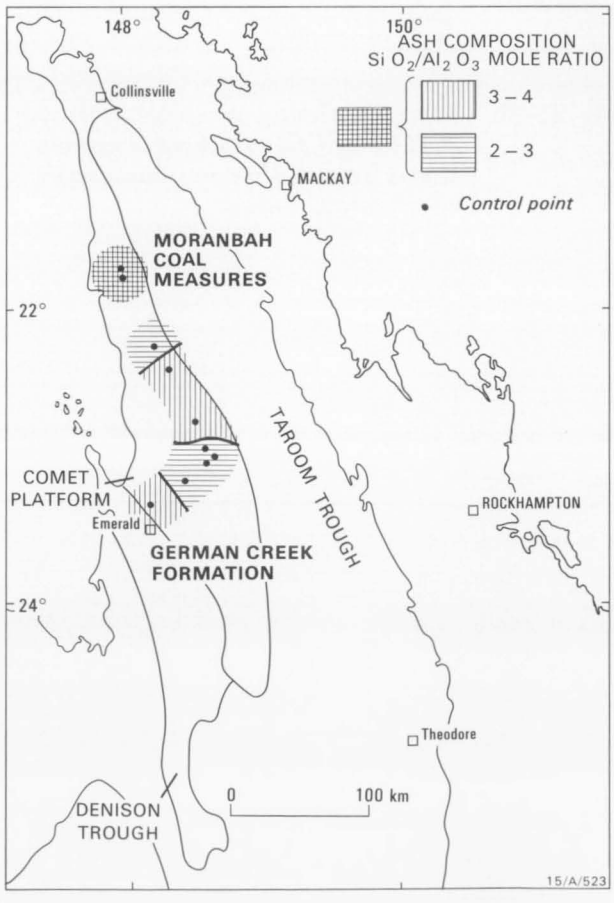


Fig. 22–23. Lateral variation of ash composition (CCC or 1.60FC) for lower part of upper coal measures from the Bowen Basin.

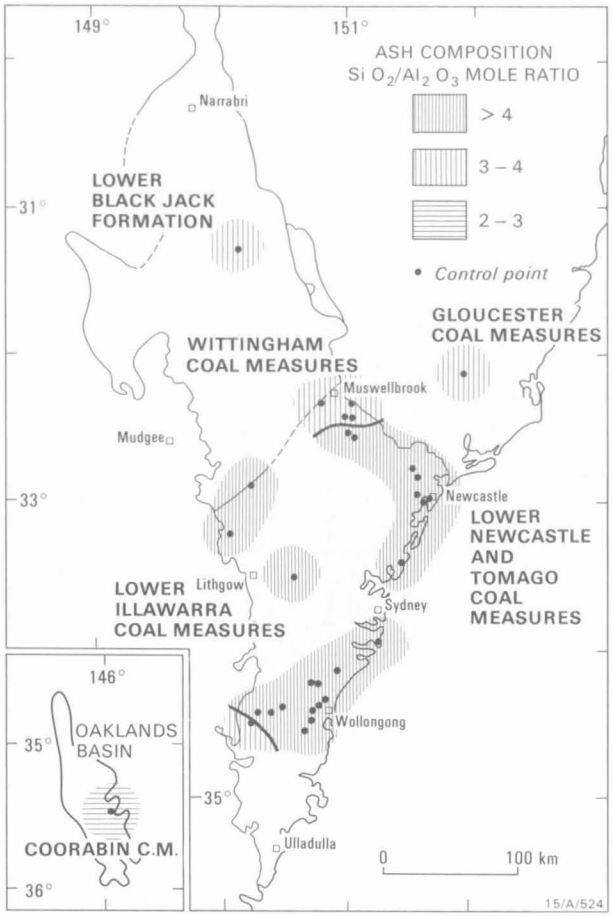


Fig. 22–24. Lateral variation of ash composition (CCC or 1.60FC) for lower part of upper coal measures from the Sydney, Gunnedah, Gloucester and Oaklands Basins.

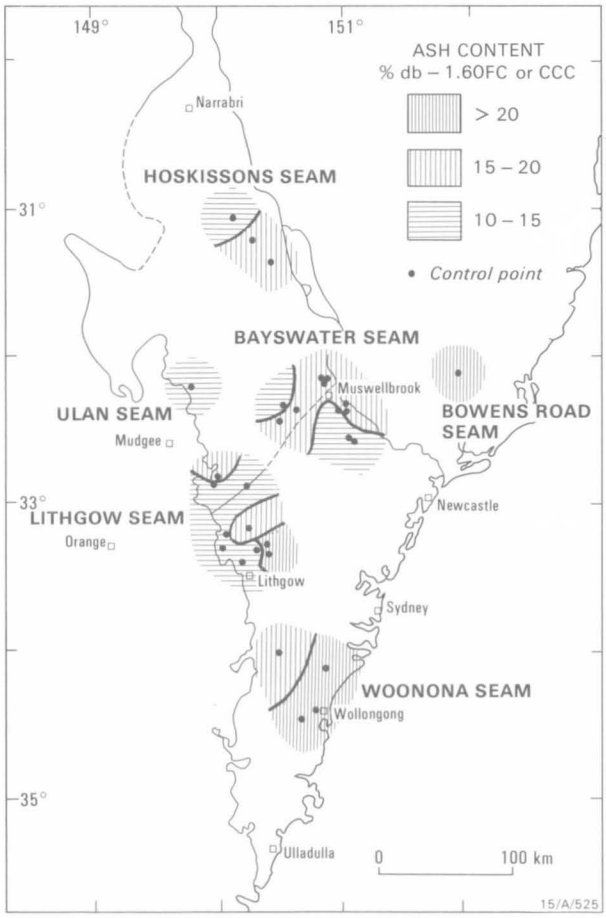


Fig. 22–25. Lateral variation of ash content (%db–CCC or 1.60FC) in the Bayswater seam sequence from the Sydney, Gunnedah, and Gloucester Basins.

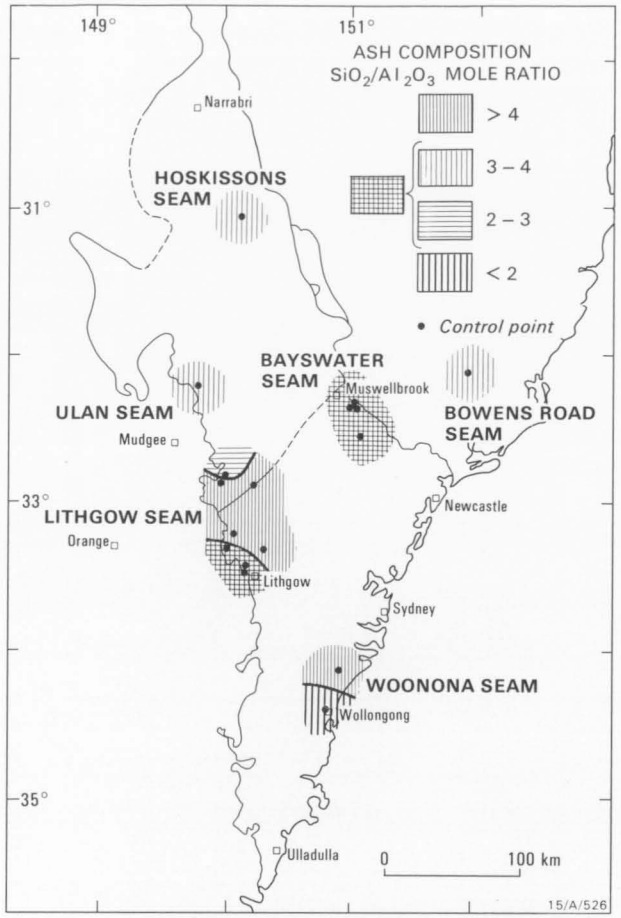


Fig. 22–26. Lateral variation of ash composition (CCC or 1.60FC) for the Bayswater seam sequence from the Sydney, Gunnedah and Gloucester Basins.

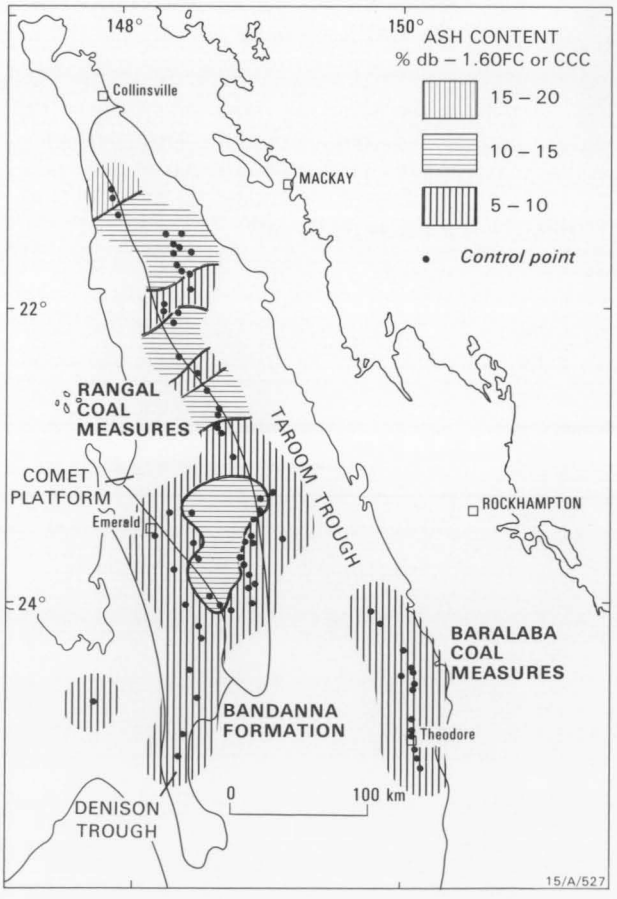


Fig. 22–27. Lateral variation of ash content (%db–CCC or 1.60FC) in top part of upper coal measures seams from the Bowen Basin.

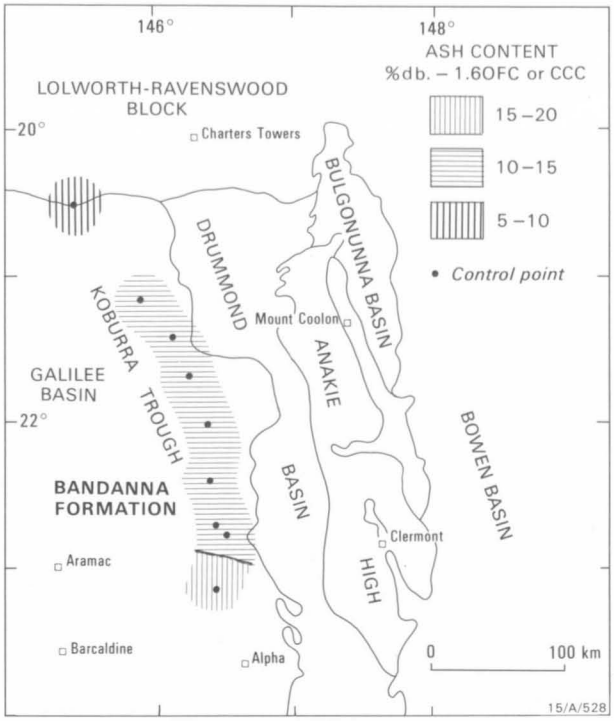


Fig. 22–28. Lateral variation of ash content (%db–CCC or 1.90FC) for the E and F seams in the top part of upper coal measures Bandanna Formation from the Galilee Basin.

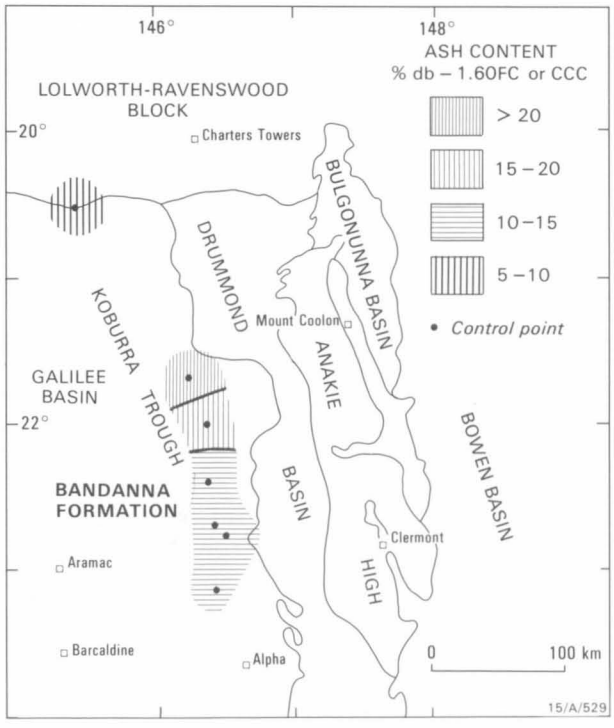


Fig. 22–29. Lateral variation of ash content (%db–CCC or 1.90FC) for the A and B seams in the top part of upper coal measures Bandanna Formation from the Galilee Basin.

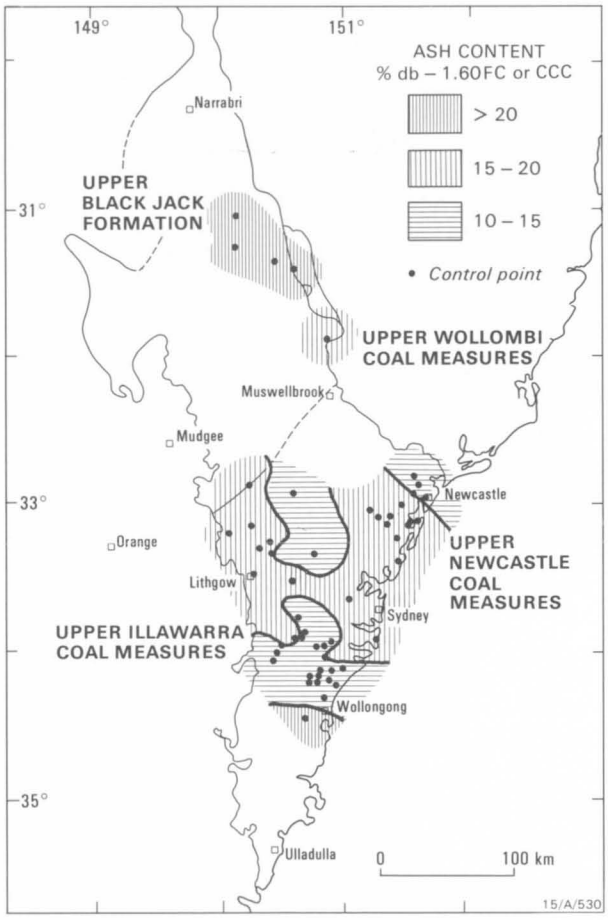


Fig. 22–30. Lateral variation of ash content (%db–CCC or 1.60FC) in top part of upper coal measures seams from the Sydney and Gunnedah Basins.

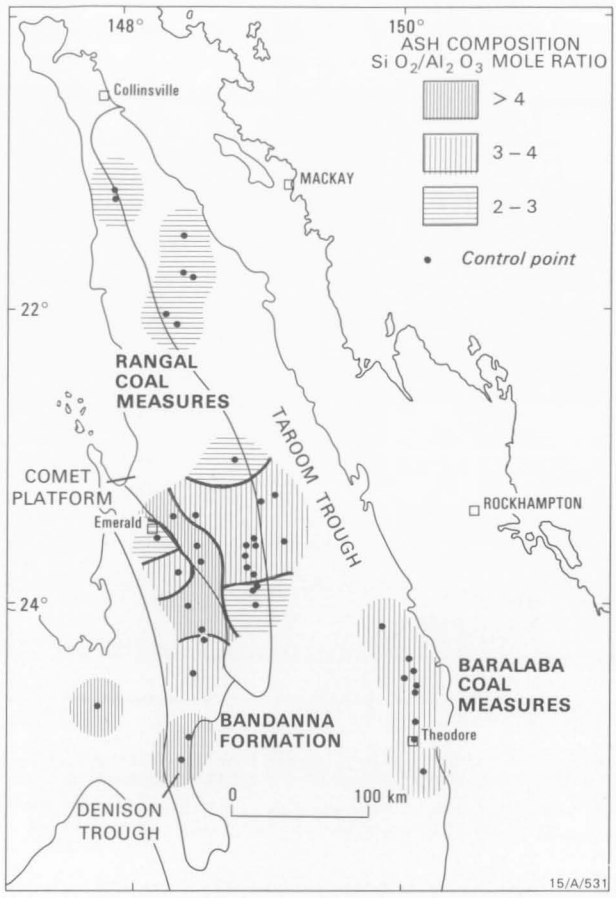


Fig. 22–31. Lateral variation of ash composition (CCC or 1.60FC) for top part of upper coal measures seams from the Bowen Basin.

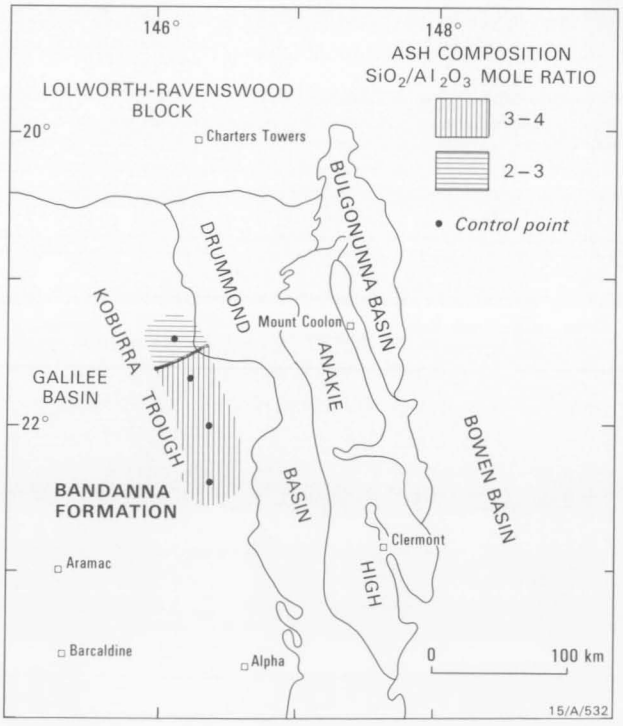


Fig. 22–32. Lateral variation of ash composition (1.90FC or CCC) for the E and F seams in the top part of upper coal measures Bandanna Formation from the Galilee Basin.

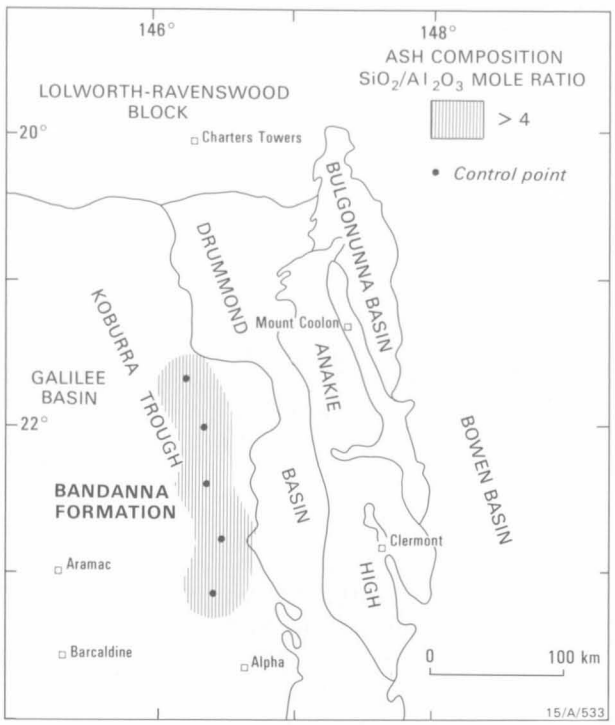


Fig. 22–33. Lateral variation of ash composition (1.90FC or CCC) for the A and B seams in the top part of upper coal measures Bandanna Formation from the Galilee Basin.

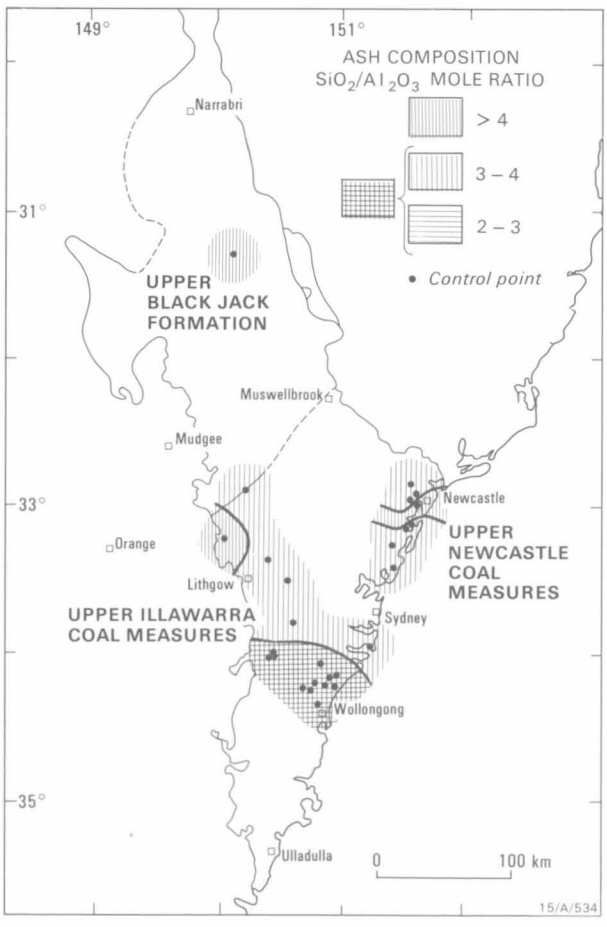


Fig. 22–34. Lateral variation of ash composition (CCC or 1.60FC) for top part of upper coal measures seams from the Sydney and Gunnedah Basins.

Conclusions

Inherent ash content of the Permian coals varies, independently of coal type (Chapter 19), sulphur content (Chapter 20), and original sedimentary environment, throughout most of the basins. This is probably due to the geographically and temporally variable influx of volcanic detritus via air fall or aqueously redistributed material.

The SiO_2/Al_2O_3 ratio of the coal ash is generally low to medium for the paralic Early Permian sequences. In the Late Permian, the SiO_2/Al_2O_3 ratio is low at the base of the sequences, high in the middle, and low to high at the top. The lateral variation in the SiO_2/Al_2O_3 ratio may represent the influence of depositional milieus in the top of the Bowen Basin discussed in Chapter 24. However, laterally variable SiO_2/Al_2O_3 ratios in many of the Sydney Basin sequences and a trend of increasing ash content with increasing SiO_2/Al_2O_3 ratio, irrespective of coal type and sedimentary environment, suggest that siliceous, volcanically derived, material may account for much of the variation in the Sydney Basin.

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CHAPTER 23

Trace Elements in the Permian Coals

by
D.J. Swaine

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Introduction

The Permian bituminous coals of New South Wales and Queensland are used mainly for power production and for coke making and large tonnages are exported. It is possible that in the future coal will undergo liquefaction. In every case, the trace elements in the coals are of importance. For example, small amounts of phosphorus and arsenic in coke for steel-making may affect the quality of the steel. The combustion of coal in power stations releases many trace elements which are ultimately found in fly-ash, bottom-ash and in very fine ash reaching the atmosphere with the stack gases. This dispersal of trace elements results in their subsequent "dry" deposition and precipitation with rain. A current investigation of trace element distribution around the Wallerawang power station, about 120 km northwest from Sydney, is showing that only very small amounts are involved (Godbeer & others, 1981). Trace elements of prime environmental interest are arsenic, cadmium, chromium, fluorine, lead, mercury, nickel and selenium, while others that are of potential interest are antimony, beryllium, boron, chlorine, cobalt, copper, manganese, molybdenum, thallium, thorium, tin, uranium, vanadium and zinc (Swaine, 1982). During coal liquefaction, some elements, for example, arsenic, nickel, molybdenum and vanadium, may have catalytic effects.

During coal mining, preparation and storage, trace elements should be considered. For example, the weathering of coals with pyrite (some in framboidal form) may form acid solutions which can leach trace elements from the coal and overburden. Trace elements in the latter, which becomes topsoil during rehabilitation, may limit the growth of vegetation, favouring deficiency or excess conditions (Swaine, 1980a).

Mode of Occurrence

Some trace elements in the precursor vegetation may have been retained during the process of coalification. However, there would have been some losses by leaching as well as gains by adsorption from swamp waters (Swaine, 1975, 1980b). Most trace elements occur in coal associated with the organic matter, as discrete minerals, as replacement cations or adsorbed on clays. Some minerals found in Australian bituminous coals are pyrite, chalcopyrite, galena, sphalerite, barite and zircon (Kemezys & Taylor, 1964). Manganese is incorporated in siderite, probably as a replacement cation (Brown & Swaine, 1964), while cadmium is closely associated with zinc in sphalerite, where it is probably in solid solution replacing some of the Zn (Gluskoter & Lindahl, 1973). It is rarely possible to determine the proportion of the total content of a particular element that is in one or other of the above forms. In general, it would seem that most elements are partly associated with organic material, and partly with minerals. Several elements, for example, cadmium, lead, zinc, mercury, nickel, selenium, cobalt, copper and molybdenum, are present as or are in sulphide minerals. However, there is a tendency for low-sulphur Australian coals to be low in these elements.

Contents of Trace Elements

During the past 20 years, coal from several seams in New South Wales and Queensland have been analysed for about 60 trace elements, mainly by optical emission spectrography and by atomic absorption spectrometry. A general idea of the results can be obtained by considering the ranges for all values and those for 90% of values (Table 23–1;

TABLE 23–1 CONTENTS OF TRACE ELEMENTS IN BITUMINOUS COALS FROM NEW SOUTH WALES AND QUEENSLAND (as ppm in dry coal)

	Range of contents	*Range for 90% of value*
Ag	<0.2 — 1	<0.2 — 0.6
As	<1 — 55	<1 — 10
B	1.5 — 300	4 — 200
Ba	<40 — 1000	<40 — 500
Be	<0.4 — 8	<0.4 — 5
Cd	0.05 — 0.20	0.06 — 0.15
Cl	<100 — 1000	<100 — 400
Co	<0.6 — 30	<0.6 — 20
Cr	<1.5 — 30	<1.5 — 20
Cu	2.5 — 40	6 — 30
F	15 — 500	20 — 190
Ga	1 — 20	1.5 — 10
Ge	<0.3 — 30	1 — 30
Hg	0.026 — 0.40	0.026 — 0.2
La	<4 — 50	<4 — 30
Mn	2.5 — 900	4 — 600
Mo	<0.3 — 6	0.3 — 4
Ni	0.8 — 70	3 — 50
P	30 — 4000	40 — 1000
Pb	1.5 — 60	2 — 40
Sb	<0.1 — 1.7	<0.1 — 1.3
Sc	<0.3 — 30	1 — 10
Se	0.21 — 2.5	0.25 — 1.6
Sn	<0.9 — 15	<0.9 — 7
Sr	<20 — 1000	<20 — 400
Th	<0.2 — 8	<0.2 — 6
Tl	<0.2	–
Ti	400 — 4000	500 — 3000
U	0.4 — 5	0.4 — 3.8
V	4 — 90	10 — 60
Y	1 — 25	2 — 20
Zn	12 — 73	13 — 46
Zr	6 — 400	15 — 300

based on Swaine 1977 and 1979). Data are also available for lithium, rubidium, caesium, the rare earths and other elements; however, some others have not been detected even at sub-ppm levels. In some cases, the concentrations are very low and only detectable by very sensitive methods. For example, gold was found to be present at 0.001 ppm by neutron activation analysis (R.H. Filby, private communication, 1982). There is evidence from one seam (Lithgow) that the contents of several trace elements vary only by a factor of two or three to one. Indeed, for cadmium the range for 90% of values is very narrow, even for samples from several seams (Godbeer & Swaine, 1979).

Trace Elements as Indicators of Marine Influence and for Seam Correlation

Trace elements may be helpful as indicators of marine influence on coal seams. The difference in boron in sea water (4.6 ppm B) and in river water (about 0.01 ppm B) is the basis for using it to discriminate between a seam influenced by marine, brackish or freshwater conditions. It is postulated that sea water entering the former swamp during the early stages of coalification increases the boron content of the swamp water, thereby providing a source of boron for uptake by organic matter (Swaine, 1971). On the basis of boron contents in clean-coal composites from seams in the Sydney Basin, Swaine (1962) regarded coals from the Greta Coal Measures (>120 ppm B) as marine-influenced coals and those from the Illawarra Coal Measures (up to 40 ppm B) as freshwater types. Values in the range 40–120 ppm B were for brackish-water coals (Fig. 23–1). On this assumption, it was also suggested that coals from the Tomago Coal Measures had been under brackish-water influence. Later studies of coals from the Bowen Basin led to the view that some seams in the Theodore district likewise had been exposed to brackish milieus (Swaine, 1971). Although Degens & others (1957) had used some other elements to differentiate marine from non-marine shales, Swaine (1967) did not find gallium, cobalt and nickel as definitive as boron for Sydney Basin coals.

Attempts have been made to employ trace elements to correlate coal seams. For example, Swaine (1983) used for this purpose copper, vanadium, gallium and yttrium for seams in the Illawarra and Newcastle Coal Measures. The data were arranged vertically in stratigraphic order and the mean values were joined to give trend curves.

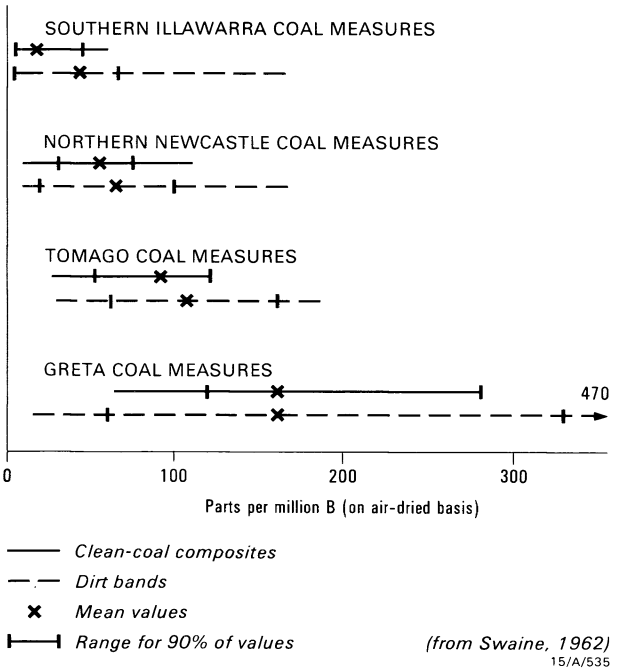

Fig. 23–1. Ranges and mean contents of boron in coal measures from the Sydney Basin. (From Swaine, 1962.)

Assuming that a particular seam has a fixed trend, then correlations were found between Bulli–Wallarah, Balgownie–Great Northern, and Wongawilli–Fassifern. This evidence cannot be applied in isolation, and stratigraphic and other approaches are needed. The successful use of trace-element data for seam correlation depends on careful sampling of seams, together with proper analysis. Sufficient data must be available for the meaningful application of statistics.

Concluding Remarks

Permian coals from eastern Australia have trace elements varying from sub-ppm levels to several hundred ppm. Most of the coals are low in sulphur and tend to be low in those elements that form sulphides or are present as traces in pyrite.

As well as being relevant during the mining and usage of coal, especially in connection with environmental aspects, trace-element contents may be helpful in ascertaining the extent of marine influence, if any, and in correlating seams.

It is suggested that before coal is commercially used, especially for power production, representative samples should be analysed for some trace elements and compared with the ranges in Table 23–1 to ensure that abnormally high levels are absent. Washed coals will be lower in trace elements than run-of-mine coals and, hence, trace-

element contents should be in the ranges for 90% of values.

In environmental considerations of trace elements, it is important to remember that many trace elements are essential for the healthy growth of plants, animals and humans. There is a danger that the common stress on toxicity may shift the emphasis away from essentiality.

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CHAPTER 24

Relationship Between Geological Setting and Coal-Type and Quality in the Permian Basins

by
J.W. Hunt & A.T. Brakel

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Tectonic Setting

The major economic coal basins of eastern Australia, the Sydney, Gunnedah and Bowen Basins (Fig. 24–1), were developed on the eastern margin of Australia during the Permian, although the nature of the basins, i.e., foredeep, forearc, overthrust, rift, thermal or transform strike-slip, is still problematic (Harrington, 1982). They are interpreted as transform basins in Chapter 28. These basins are referred to as "marginal basins", however, because of their setting marginal to the craton. Important for coal formation was the presence of deep troughs with high subsidence and sedimentation rates, in which thick, coal-bearing sequences were deposited. The marginal basins also include "shelf areas" subject to low subsidence and sedimentation rates, with thin, coal-bearing sequences, lapping onto the western carton.

The more westerly Permian basins (Galilee, Cooper, Pedirka and Arckaringa) represent large, sometimes interconnected basins, formed on broad, in places fault-bounded, downwarps in the crust. Most researchers have considered that these basins overlie a Precambrian craton and are, therefore, intracratonic. Harrington (1974) considered that they might be parts of the infilling of a marginal sea formed by rifting of the craton in the late Proterozoic or Early Cambrian. Intracratonic basins are characterised by generally low subsidence and sedimentation rates and, consequently, thin sequences. These basins were also sites of coal deposition during the Permian, although the coal seams developed are economically less important in quality, quantity and accessibility compared with those in the marginal basins.

The Oaklands Basin to the southwest of the Sydney Basin, the Ashford Basin in the New England Block to the north, the Collie Basin within the Precambrian shield of Western Australia, and perhaps the Blair Athol and Wolfang Basins west of

Fig. 24–1. Location of the Permian coal basins.

the Bowen Basin are grabens or half grabens or downwarps that represent smaller intracratonic, intramontane or topographic basins subject to very low subsidence and sedimentation rates. Several of these were probably connected intermittently and genetically related to adjacent basins.

The marginal basins are distinguished by thicker sequences with more numerous coal seams and lower coal-to-sediment ratios, when contrasted with the intracratonic basins. The thickest coal seams are found mainly in the intracratonic basins (Smyth, 1980) reflecting longer periods with negligible sedimentation and subsidence when compared with the marginal basins.

Depositional Environments

Broad palaeoenvironments differentiated in the marginal basins include lower and upper delta plain, fluvial, alluvial fan, barrier–lagoonal, and lacustrine settings.

The lower delta plain facies have been interpreted on the basis of upward-coarsening sequences of laminated and burrowed bay silts in the base, and coarser-grained splay sands, mouth bars, and channel sands at the top. The upper delta plain and fluvial facies are less clearly defined and consist predominantly of sandy channel deposits and tuffaceous beds with associated fine-grained, carbonaceous over-bank sediments, showing root penetration. The term "fluvial", applied mainly on the basis of upward-fining channel sands which are also common in the upper delta plain facies, has led to an over-representation of fluvial facies in the literature.

Braided-fluvial sediments on alluvial fans are present throughout the sequences in the marginal basins, but are more abundant towards the top of the coal measures. They are composed of predominantly conglomerate and sandstone, and are tabular to wedge-shaped bodies. In areas of sparse information or conflicting opinion on depositional setting, the general term "fluvio-deltaic" has been applied. The lower delta plain and alluvial fan regimes are easier to recognise, but the upper delta plain and fluvial (alluvial) plain deposits are gradational and, therefore, difficult to distinguish. In some publications, even ubiquitous burrowing has been overlooked and the term fluvial applied to sequences.

A horizon of probable back-barrier sandstone and pebbly sandstone, overlain by a petrographically distinctive coal overlying lagoonal or lacustrine deposits, is present throughout most of the Sydney and Gunnedah Basins. The barrier sediments are found at the top of an upward-coarsening sequence which grades from a burrowed fine-grained deposit at the base.

The term paralic is used for undifferentiated coastal settings, which may include lower delta plain, fan delta and barrier environments and facies. In the absence of sedimentological interpretation, these milieus have been recognised principally on the basis of the high sulphur (>1.0% daf) coals.

In the marginal basins, non-marine environments tend to be deltaic at the base, becoming fluvial upwards. Marine to brackish intercalations of intensely bioturbated, pyritic, fine-grained sediments are typical, particularly of the lower part of the upper coal measures. Coarse, braided fluviatile deposits occur intermittently throughout, probably due to local tectonic controls. Alluvial fan deposits are a common major component at the top of the coal measures, and they grade laterally into transitional facies away from their source areas.

Conaghan (1982), Cameron & others (1982) and McDonnel (private communication), representing a minority viewpoint, believe that many sections interpreted in the past as upper delta plain–fluvial and braided fluvial in the Sydney Basin are in reality fluvio-lacustrine.

Other more local environments discussed in the following section have been reported in sub-regional studies, although some interpretations are contentious.

The intracratonic basins are characterised by meandering fluvial sediments which, in the Cooper and Galilee Basins, have probably reworked initially deltaic deposits, with overbank, lacustrine and paludal elements in the associated flood plain depressions. These terrestrial basins could be expected to grade laterally into transitional facies (deltaic or shoreline) where they join marine facies in the marginal basins.

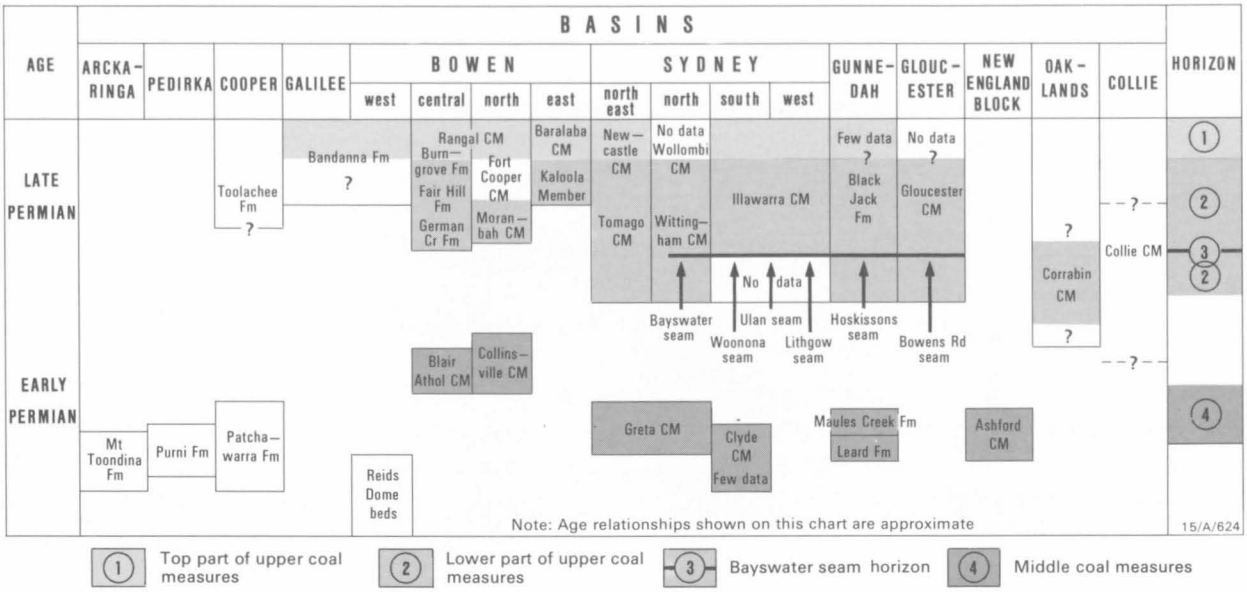
Table 24–1 shows a simplified correlation of coal-bearing units, discussed in the following section summarizing interpretations of the depositional systems.

Early Permian

Marginal basins

Bowen Basin. This basin contains Early Permian coal measures at two horizons, belonging to the basal and middle coal measures groups. The basal coal measure sequence (the Reids Dome beds) was formed in the Sakmarian–early Artinskian, whereas the middle coal measure sequence (including the Collinsville Coal Measures and Aldebaran Sandstone) was deposited in the late Artinskian–Kungurian. Environments in the Reids Dome beds included talus slope, alluvial fan, braided and meandering fluvial paludal, lacustrine, upper and lower delta plain, fan delta, back-barrier, and coastal plain (McClung, 1981; Draper & Beeston, 1985).

TABLE 24–1. SIMPLIFIED CORRELATION CHART FOR THE PERMIAN COAL BASINS, SHOWING HORIZONS USED IN THE PALAEOGEOGRAPHIC RECONSTRUCTIONS



The Collinsville Coal Measures represent alluvial fan and fan-delta sediments, interrupted by a marine intercalation. Equivalents near Rugby to the south probably aggregated in a paralic setting. In the Denison Trough, coals in the Aldebaran Sandstone were deposited in a fluvio-deltaic environment (Paten & others, 1979).

Gunnedah Basin. The rapid northeasterly thickening of the Maules Creek Formation, with a predominance of coarse clastics (Brownlow, 1980), and the presence of both upward-fining and upward-coarsening sequences with the abrupt appearance of coal seams, are indicative of braided stream deposition on alluvial fans in the northeast (Crosdale, 1982) with intermittent peat formation during times of low sedimentation. Elsewhere, the sediments collected on an extensive, marshy, fluvial–coastal plain, which with time became increasingly deltaic in character (Beckett & others, 1983). The underlying Leard Formation is fluvial, and contains reworked colluvial clay pellets.

Sydney Basin. The Greta Coal Measures are commonly associated with alluvial fan conglomerates, and the high pyrite content at the top of the Greta seam indicates marine influence either laterally or vertically nearby. The coal appears to have been deposited in peat swamps associated with alluvial fan-delta systems building out into open water. Likely subenvironments are: interfan areas, salt marshes behind fringing barrier bars, and raised peat bogs on the surfaces of the fan-deltas. In the Muswellbrook Anticline, the coal measures are dominantly fluvial, but there are some sedimentary structures in one of the sandstones possibly suggestive of tidal influence. That this area was probably down-dip from alluvial fans is indicated by an increasing amount of coarse clastics towards the bounding Hunter Thrust System (Morris, 1982).

The Clyde Coal Measures were probably developed in a number of swamps behind fringing barriers along the distil margins of a fan-delta complex (Evans & others, 1983).

Small intracratonic basins

Blair Athol and Wolfang Basins. The Blair Athol Basin has been described as an isolated topographic depression (intramontane basin) by Witcher & others (1960) and Osman (1970). The same can be said of the Wolfang Basin. Smyth (1980) attributed the very thick seams in these basins to origin in a raised peat bog in a broadly fluvial setting.

Ashford Basin. The Ashford Coal Measures are located within the orogenic New England Fold Belt east of the Gunnedah Basin and north of the Sydney Basin. Sedimentation probably started as alluvial fans, changed to distal fluvial plain, and then reverted to alluvial fans.

Large intracratonic basins

Cooper Basin. Early Permian coal measures in the Cooper Basin are found within the Patchawarra Formation (basal coal measures), and the Epsilon and Daralingie Formations[1] (middle coal measures). The Patchawarra Formation was deposited in a predominantly fluvial environment with high-sinuosity meandering streams (Grund, 1966; Thornton, 1979). The middle coal measures were laid down in deltas building out into bodies of water which were probably lakes.

1 Formerly "Daralingie beds" — see: Morton, J.G.G. & Gatehouse, C.G. 1985 — A revision of the Toolachee and Daralingie Formations, Cooper Basin, South Australia. *Geological Survey of South Australia*, Quarterly Notes, vol. 94, 8–15.

Arckaringa Basin. This basin consists of deep marginal grabens or half-grabens and a large central area of shallow basement (Devine & Youngs, 1975). The environment for the Mt. Toondina Formation was probably fluvial.

Pedirka Basin. The coal-bearing Purni Formation in the Pedirka Basin consists of terrestrial sediments deposited following a southwesterly retreat of the sea through the Arckaringa Basin (Devine & Youngs, 1975).

Depositional models

Cross-sections of depositional facies in hypothetical basins, derived from those described for the Early Permian basins, are shown in Fig. 24–2. The thicknesses illustrate the differences between the marginal and intracratonic basins, and shelf and trough sequences in the former, but are not to scale.

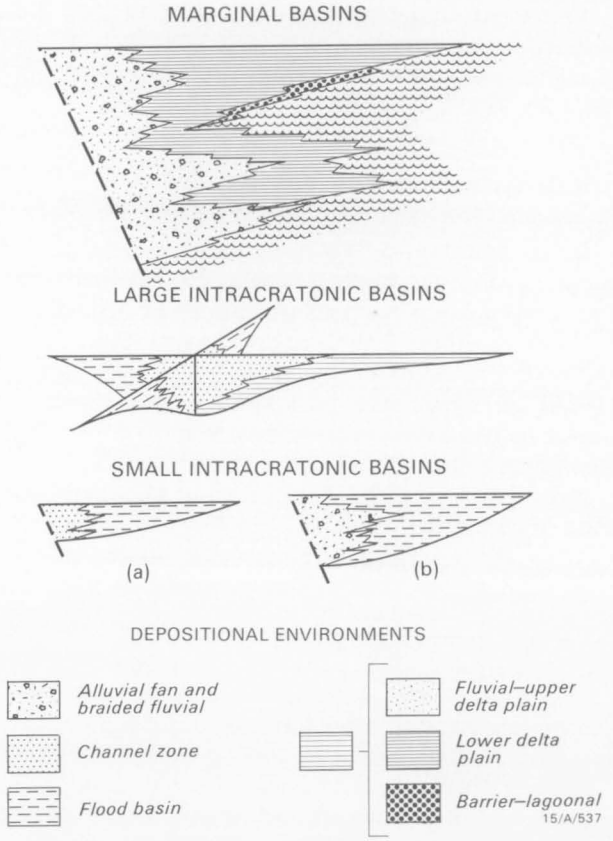


Fig. 24–2. Depositional environments of Early Permian seams in the marginal and intracratonic basins. Variation in the marginal basins reflect mainly the Sydney and Gunnedah Basins — the large intracratonic basin is based on the Cooper Basin, the small intracratonic (a) on the Blair Athol and the small intracratonic (b) on the Ashford.

There are four models: (1) a marginal basin model based on depositional elements of the Sydney, Gunnedah, and Bowen Basins; (2) a large-intracratonic basin model depicting the Cooper Basin; (3) a small-intracratonic model (a) based on the Blair Athol and Wolfang Basins; and (4) another small-intracratonic model (b) founded on the Ashford Basin.

Late Permian

Marginal basins

Bowen Basin. Economic coal facies were developed in the Bowen Basin both early and late in upper coal measure time. The lowest of these, the German Creek Formation, is overlain by the marine MacMillan Formation, which interfingers with the partly laterally equivalent Moranbah Coal Measures. These units are, in turn, overlain throughout most of the northern basin by the Fair Hill and Burngrove Formations, or the Fort Cooper Coal Measures, and although these intervening strata are coal-bearing, the abundance and thickness of tuff bands has precluded their coals from being economically viable at present. Later in the Late Permian, economic coal facies formed throughout most of the basin as the Rangal Coal Measures in the north and centre, the Baralaba Coal Measures in the east, and the Bandanna Formation in the west (see Table 24–1).

The German Creek Formation overlies the marine Maria Formation, and originated in a deltaic facies that prograded from a northwesterly direction. Estuarine or interdistributary bay conditions are evidenced by abundant burrows. The Moranbah Coal Measures have been described as fluvial to upper delta plain sediments deposited in a south-flowing drainage system (Archibald, 1982; Wallin & Koppe, 1978; Staines & Koppe, 1979); Holmes (1983) has also interpreted barrier and back-barrier facies.

Palaeoenvironments of the Fair Hill Formation are poorly documented. Deltaic, fluvial, and beach facies have been recognized (Prouza, 1977). Lower delta plain facies predominate in the unit in GSQ Emerald NS2 (Hunt & Telfer, 1983). The intensely burrowed lower portion of the Burngrove Formation suggests estuarine or interdistributary bay conditions.

The Rangal Coal Measures are attributed to a fluvial system in the north (Jensen, 1971; Staines & Koppe, 1979), but in the centre of the basin a lower delta plain setting is evident (Park, 1973; Prouza, 1977). The deposition of the Baralaba Coal Measures has been described as fluvio–deltaic (Mallett & others, 1980), with fluvial elements encroaching on an extensive paludal complex in the Kianga area and giving way to deltaic components farther north. Considering the preponderance

of peat formation, the fluvial facies constitutes a subordinate element of an essentially paludal system (Mallett, 1982). Below the Surat Basin, the Baralaba Coal Measures are also fluvio-deltaic (see Chaper 8). The Bandanna Formation in the west is dominantly deltaic, paludal and lacustrine (Gray, 1980; Draper & McClung, 1983).

Gunnedah Basin. The Black Jack Formation is transitional with underlying marine sediments. Environments range from lower delta plain near the base to upper delta plain and alluvial fan higher up (Beckett & others, 1983).

Sydney Basin. Coal-bearing facies (the upper coal measures) were deposited in the Sydney Basin throughout most of the Late Permian. In the northeast, around Newcastle, the Tomago and overlying Newcastle Coal Measures have economic coal, except for a barren interval in the upper Tomago, and the tuff-banded coals in the middle of the Newcastle. Their equivalents in the upper Hunter Valley to the west are the Wittingham and overlying Wollombi Coal Measures. The Wittingham Coal Measures are very productive, but the Wollombi Coal Measures are highly tuff-banded and uneconomic. In the south and west of the Sydney Basin, the Illawarra Coal Measures are equivalent to the northern sequences of the basin and have several economic seams (Table 24–1).

The sequence in the northeast represents a transition from burrowed estuarine and lower deltaic facies in the Tomago and basal Newcastle Coal Measures (Conolly & Ferm, 1971; Diessel, 1980) to alluvial fan deposits of coarse clastics in the upper sub-groups of the Newcastle Coal Measures.

The Wittingham Coal Measures are transitional with underlying marine rocks, and facies include burrowed deltaic, fluvial meandering (Britten, 1975b; Marchioni, 1982), and alluvial piedmont types (Cameron & others, 1982). Conaghan (1982) postulated a controversial deep-water lacustrine origin for some coals in the region. Britten & Smyth (1973) proposed a shallow lagoonal/lacustrine environment for the Bayswater seam (towards the base of the Wittingham Coal Measures), but Smyth (1980) amended the interpretation to part lacustrine/part fluvial.

The main coal-bearing sequence in the Illawarra Coal Measures to the south of the basin has been described as lower delta plain in origin (Bowman, 1980). The basal seams are associated with burrowed pro-delta and lower delta plain facies; the upper seams have also been attributed to a lower delta plain environment, but higher above sea level (Conolly & Ferm, 1971). To the west (Fig. 8), this coal-bearing sequence contains distal alluvial fan and braided fluvial sediments overlain by pro-delta, lower delta plain, and upper deltaic to fluvial sediments (Bembrick, 1981, 1983).

Gloucester Basin. The Dewrang Group, at the base of the sequence, probably represents a near-shore marine, barrier, freshwater lagoon and fan delta complex (Lennox & Wilcock, 1985). The younger Gloucester Coal Measures are dominated by meandering stream-valley fills and the braided sheet outwash of alluvial fans (Hancock, 1974). The recent work of Lennox & Wilcock (1985) has discovered a marine intercalation and associated lower delta plain and other paralic deposits below the Bowens Road seam.

Large intracratonic basins

Galilee Basin. A thin sequence of Late Permian coal measures (the Bandanna Formation) is exposed only along the eastern margin of the Galilee Basin. The palaeoenvironment of the sequence has been described as a southward prograding delta (Hawkins, 1976).

Cooper Basin. Late Permian coal measures in the Toolachee Formation of the Cooper Basin are known only from petroleum exploration drilling; petrographic data are available from the Patchawarra and Nappamerri Troughs in the South Australian half of the basin. Extensive floodplains traversed by northerly flowing channels during a tectonically quiescent period have been proposed for the Toolachee Formation (Thornton, 1979).

Small intracratonic basins

Oaklands Basin. The Coorabin Coal Measures at the top of the sequence in the Oaklands Basin contain only a few seams (Driver, 1975). Point bar cycles indicate meandering stream deposition (Morgan, 1977).

Collie Basin. The Collie Basin is a fault-bounded intracratonic basin with an Early and Late Permian coal measure sequence, within the Western Australian Precambrian shield. Sedimentation in the Muja Sub-basin probably took place in response to sporadic movement along bounding faults, so that coarse, braided fluvial deposits came to interfinger with fine-grained, flood-basin sediments and coal (Park, 1982).

Depositional models

Generalized diagrammatic cross-sections of basins, showing depositional environments (Fig. 24–3) are based on cross-sections for the Late Permian basins. The thicknesses illustrate the differences between the marginal and intracratonic basins, and the shelf and trough sequences in the former, but are not to scale.

As for the Early Permian, a model has been derived for a typical marginal basin, and a large intracatonic basin, as well as two models for small intracratonic basins (*a* and *b*). These are based respectively on various depositional elements in the Sydney, Gunnedah and Bowen Basins; the Cooper and Galilee Basins; the Oaklands Basin; and the Ashford Basin.

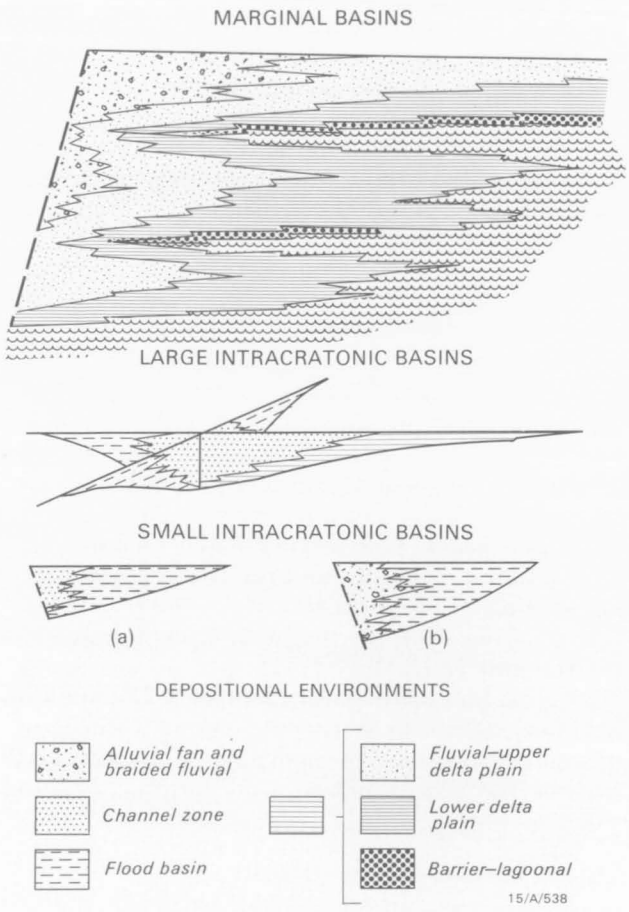


Fig. 24–3. Depositional environments of Late Permian seams in the marginal and intracratonic basins.

Geographic Setting and the Permian Flora

Coal type is determined principally by the kind of flora which formed the precursor peat, but also by the extent of its alteration by subaerial or subaqueous oxidation, or biochemical agents, during deposition and early diagenesis. The kind of flora and the chemical environment of the precursor were determined by complex interactions of geography and climate.

The Permian succession of floras was climatically controlled and changed gradationally in the Sydney Basin (Retallack, 1980) and, given the meridional orientation of the basins, some species may have been significantly diachronous, migrating polewards as the edges of the Permian ice-cap receded. Following the waning of glaciation early in the Permian, a generally cool-temperate climate prevailed for the remainder of the Permian period. The Permian (and Triassic) flora consist of a low-diversity pteridosperm-dominated assemblage, with the few elements often represented by innumerable individuals (Gould & Shibaoka, 1980). A few varieties of the lycopods, equisitaleans and ferns are present (Gould, 1975). An important implication is that the peat-forming components of the flora may be regarded as a more or less homogeneous input to the Permian coal swamps. Low diversity is also a feature of modern ombrotrophic mires.

Some Early Permian coal-bearing sequences overlie formations containing glacigene beds. The start of coal formation in the Sydney Basin generally coincided with the waning of polar climatic conditions and the establishment of a *Gangamopteris*-dominated flora (Retallack, 1980). Glacial influence was least in the Bowen Basin which was some 12° farther north in palaeolatitude than the Sydney and Gunnedah Basins. The extent of marine influence on coals was least in the intracratonic basins, but reached a maximum in the Sydney, Gunnedah, Bowen and Arckaringa Basins, which were connected to the sea. Marine conditions were established throughout most of the marginal basins between late in the Early Permian and early in the Late Permian. Following regression of the sea in the Late Permian, and further climatic amelioration, coal measures composed of a *Glossopteris*-dominated flora were formed throughout the Sydney, Gunnedah, Bowen, Galilee and Cooper Basins.

Peat can form in any place where there is sufficient organic growth and water collects on its way to the sea. The drainage of a basin is determined by processes of both regional (e.g., isostatic) or global (e.g., eustatic) scale. Some generalisations can be made on drainage conditions and the succession of peat-forming communities in various types of basins, although a great diversity, particularly of floral succession, is characteristic of modern mires (Walker, 1970).

Large and small inland sedimentary basins have the greatest diversity of successions. Landlocked basins are particularly susceptible to periodic flooding owing to increased water supply, and their modern counterparts are characterised by initial colonisation by macrophytes and reed-swamps. Given the productivity of floating macrophytes and reeds in modern swamp successions (similar to the productivity of typical rain forest) (Moore & Bellamy, 1974), combined with their low preservation potential as macrofossils, it is possible that the contribution of Permian analogues has been underestimated. Beeston (1982) has recently identified articulate (reedy) facies in coals formed in a lacustrine setting in the Reids Dome beds of the Bowen Basin. Coastal and estuarine environments are typically colonised by herbaceous and/or aboreal successions, resulting in mainly woody peats. Smith (1962) found that bright plies in the base of Carboniferous coal seams did not differ petrologically or palynologically from other bright

plies in the same seams, supporting initial invasion of the peat-forming site by arborescent, not "reedy", vegetation. Coastal lagoons or salt marshes may be sites of peat formed from reeds, but are rarely preserved.

The extent of alteration of the peat-forming material is dependent on several interrelated factors, including rate of subsidence, climate, geographical position, depositional environment, composition of the peat-forming flora, and, most importantly, the level and composition of swamp water and fluctuations of the groundwater table. The drainage and nutrient characteristics of modern basins are probably applicable to the Permian basins.

Fluctuations in groundwater table and nutrient levels would be greatest in areas of contributive drainage within the large intracratonic basins. Smaller isolated intracratonic basins, typically with limited water catchment areas, would experience continually low water-table and nutrient levels.

The more rapidly subsiding trough sequences within the marginal basins, subject to distributive drainage, would experience continuously waterlogged conditions and high nutrient levels. The thinner shelf sequences of the marginal basins lapping onto the western craton would be subject to fluctuating water-table and nutrient levels, depending on eustatic and isostatic controls.

Relationship Between Coal Type and Quality and Geological Setting

Microlithotype Composition

Microlithotype classification was initially proposed in Germany because of variations in the technological behaviour of coals related to different maceral associations. A variety of genetic interpretations of microlithotypes has arisen, based largely on the work of Teichmüller (1950 and 1952) and Teichmüller & Thompson (1958) on coal facies in Tertiary brown coals, and Swedish investigators (see Osvald, 1937) on the role of groundwater levels in peat formation and accumulation. Recent workers (e.g., Hacquebard & others, 1967) have placed great emphasis on the kind and amount of exinite present.

Vitrinite-rich lithologies with high-semifusinite ratios and low exinite content (vitrite, fusito-clarite) are universally interpreted as wood-derived peats of the terrestrial forest or telematic forest moor, deposited under shallow anaerobic groundwater conditions (called "dry facies" or terrestrial facies by some authors to distinguish them from "submergent" lacustrine facies) and formed from aborescent and/or shrubby vegetation. The presence of resinite (up to 30%) in telinite and telocollinite of bright (vitrinite-rich) plies from the Liddell seam (in the northern Sydney Basin) further supports an origin from woody material (Marchioni, 1982). However, the interpretation of intertinite-rich lithologies, which are rare in the Tertiary and Carboniferous where the classification was developed and applied, is still highly contentious. The problem of "wet" and "dry" durains, subaqueous and subaerial oxidation and allochthonous, autochthonous or hypautochthonous (and "hydroponic"; Conaghan, 1982) deposition has been argued ever since the studies of the above-cited researches.

The arguments are summarised by Snyman (1961) and Smith (1962) and on the basis of the geological variability of Carboniferous coals. Bless & others (1981) suggested that interpretation of peatland palaeoenvironments based on maceral and microlithotype analysis, without the benefit of parallel palynological investigations (such as those by Snyman, 1961 and Smith, 1962) is disputable. Both the European genetic classification and the work of Smith (1962) are routinely applied to petrographic studies of Gondwana coals. However, both are deficient because they are based on Tertiary brown coals and Carboniferous coals, which were formed in a warm-temperature to subtropical climate, and make no allowance for the extensive tertiary blanket mires which today are characteristic of cool-temperate to arctic latitudes in the northern hemisphere. Smith's work (1962) invokes a primary (within the groundwater table) to tertiary (subaerial blanket mire) mire to explain the observed microspore and petrographic succession, and this has been applied to certain Sydney Basin coals. There is, however, a significant inconsistency when it is applied to the Australian Permian coals and, as Smith (1962) observes, the miospore sequence he proposes for the Carboniferous is not borne out for African Gondwanan coals described by Snyman (1961).

No attempt has been made in the course of this study to use microlithotypes for genetic interpretations. As a consequence of the small amount (5% average) of exinite and the dominance of sporinite in Australian Gondwana coals, the microlithotype analytical data have been essentially reduced to a two-component system measuring vitrinite (vitrite + clarite) and inertinite (inertite + durite), with all possible mixtures of vitrinite and inertinite (vitrinertite, duroclarite and clarodurite).

Microlithotype analysis at the two-component level measures the proportion of components which have attained an observed thickness (50 μm) without a significant change taking place in the palaeo-redox conditions effective in the vicinity of

the sampling site. The thickness reached in any one cycle of oxidation or reduction is a function of biological productivity and preservation, in comparison to the periodicity of changes in the redox environment both of which are determined by the interactions of flora and swamp dynamics with climatic, geographical and geological variables. Alterations in redox milieus at the 50 μm band width level probably reflect seasonal fluctuations in water table, given an accumulation rate of 1 m of peat/1000 years and a compaction ratio of 10:1.

Examination of microlithotype data demonstrate that coals from a particular area and age form a distinctive suite, with a characteristic degree of banding across the whole range of vitrinite content. The curves in Fig. 19–3b, which show equivalence of banding, were calculated from the data in Fig. 19–11c.

Early Permian sequences

Lateral variation in the degree of microscopic banding with tectonic setting is illustrated by the Early Permian coals of the marginal Sydney and Gunnedah Basins. Total thickness of representative sections for these coal measures, the aggregate thickness of various lithologies, and the range of banding of the microlithotypes, are shown in Fig. 24–4. Coals of the intracratonic basins are all fine to very finely banded in the Early Permian deposits, irrespective of palaeolatitude. The intracratonic basins are characterised by mainly fluvial systems.

The variations in banding of Early Permian microlithotypes (Fig. 24–5) are presented on the same model sections as the Early Permian depositional environments (Fig. 24–2), and are based on the data in Chapter 19.

The summary of microlithotype composition, sedimentary environment and tectonic setting for Early Permian coals in Fig. 24–6 shows a good correlation between banding of the microlithotypes and tectonic setting, but not with depositional environment applicable to all basins.

Late Permian sequences

Lateral variation in microlithotype composition with tectonic setting in the Late Permian is demonstrated by a low-vitrinite horizon within the marginal Sydney Basin (the Bayswater seam horizon in Table 24–1), which was formed following a basin-wide cycle of transgression and regression. The Bayswater seam is finely banded (h = 4–5), the Woonona seam is finely banded (h = 6), and the Lithgow seam is finely to very finely banded (h = 5½–8). The sedimentary milieu was probably back barrier–lagoonal throughout, and the microlithotypes become more finely banded towards the basin edge. The southern intracratonic basins have fine to very finely banded coals in fluvial environments. The Galilee Basin, however, contains medium-banded coals in a probable deltaic setting in the south, and the Collie Basin has medium-banded coals deposited in a fluvial system.

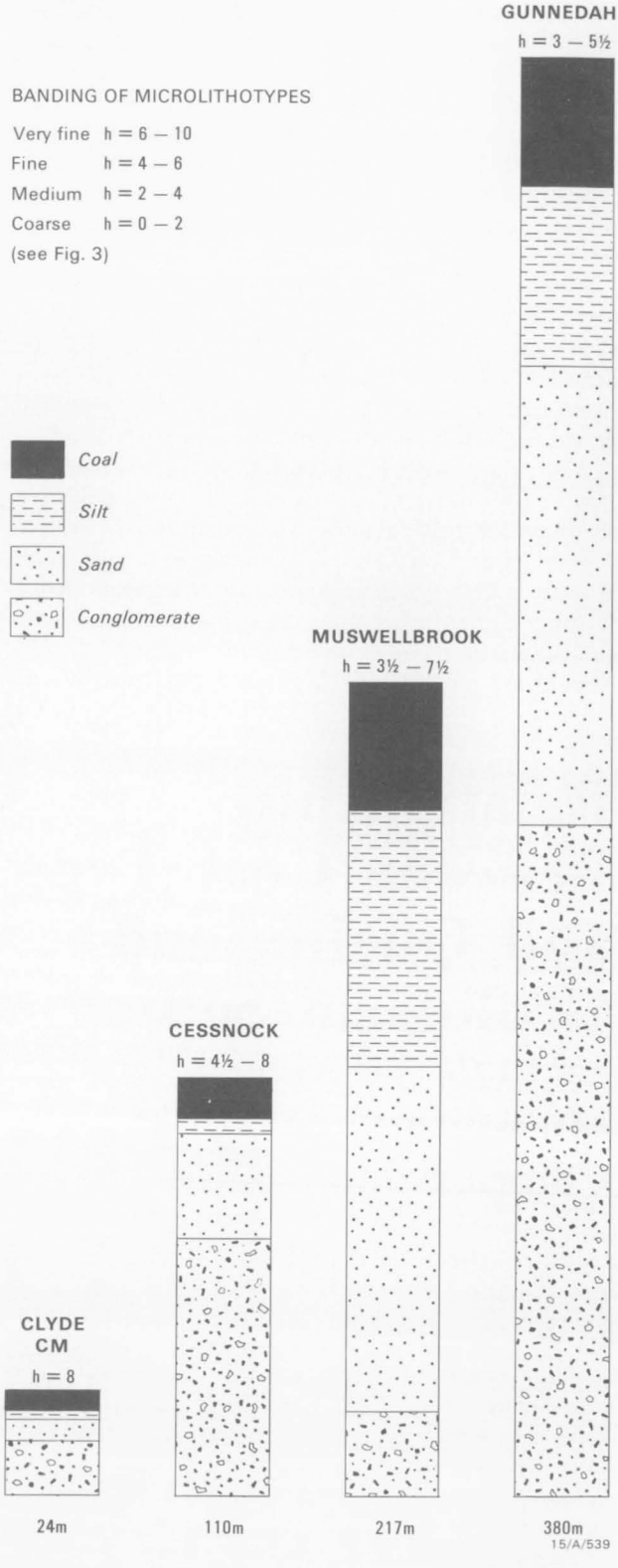


Fig. 24–4. Relationship between banding of the microlithotypes and thickness of coal-bearing sequences in the Early Permian.

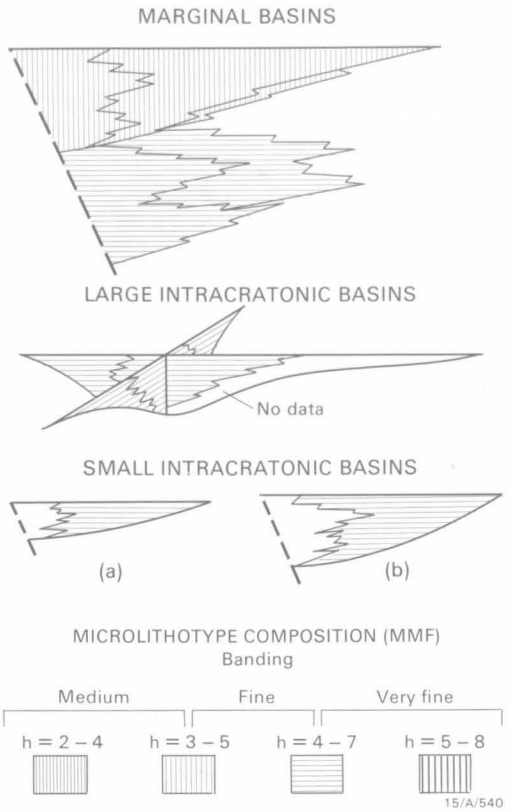


Fig. 24–5. Microlithotype banding of Early Permian seams in the marginal and intracratonic basins.

Model cross-sections showing variations in banding of microlithotypes for the Late Permian (Fig. 24–7), have been constructed similarly to Fig. 24–5, using the appropriate data from Chapter 19, and the Fig. 24–3 base.

Figure 24–8 shows the relationship between microlithotype composition and sedimentary and tectonic conditions for Late Permian coals. A good correlation exists between banding of the microlithotypes and tectonic setting and a poor correlation between banding of the microlithotypes and depositional environment.

Discussion

The trend to coarser banding in younger coals of the Sydney Basin has been attributed by Cook (1981) to differences between the Early and Late Permian flora and is supported by Retallack (1980). This trend culminates in coarse to medium banded (h = 1½–4) Triassic coals formed from a *Dicroidium*-dominated pteridosperm flora. However, vertical trends in microlithotype composition are not as well marked in the Bowen Basin as in the Sydney Basin. This may reflect a smaller variation in the coal-forming flora, because of the warmer palaeoclimate to the north.

The relationship between microlithotype composition and tectonic setting may to some extent reflect higher organic productivity in the troughs owing to better nutrient supply (Moore & Bellamy, 1974, p.50), with the reverse situation applying on the shelves and in the intracratonic basins. Variation in microscopic banding between trough and shelf sequences is usually paralleled by changes in several other geological parameters, including the total thickness of the coal measures sediments and the geometry and total as well as individual coal seam thicknesses (Diessel, 1970; Shibaoka & Smyth, 1975; Bless & others, 1981).

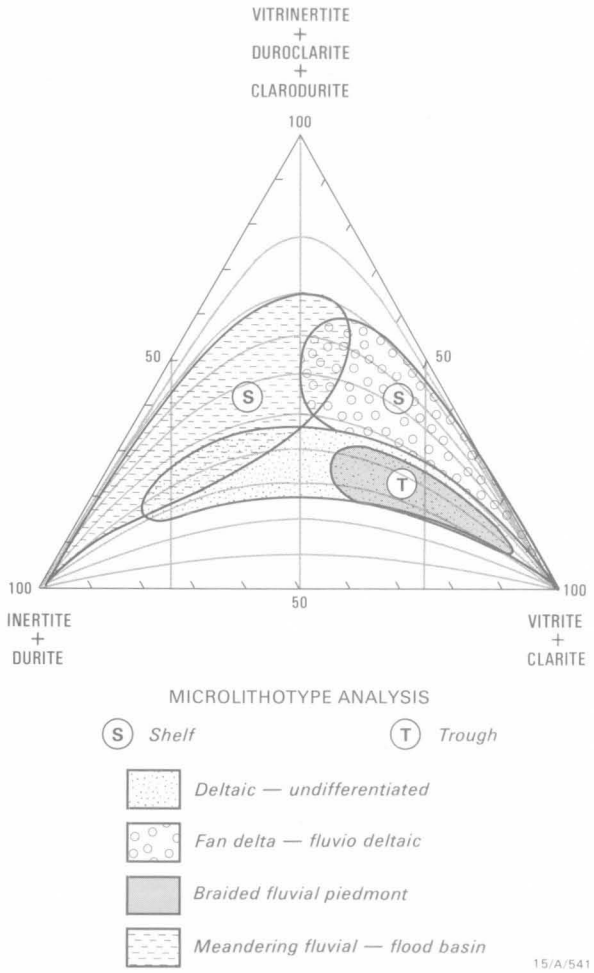


Fig. 24–6. Relationship between depositional environment and microlithotype composition of Early Permian seams.

Maceral Composition

Vitrinite content

Decomposition of organic matter is inhibited by waterlogging, low temperature (high altitude or latitude), and low pH. Vitrinite originates mainly from lignin and cellulose of plant cell walls, and

represents material which has survived oxidation in the upper layers of the peat until buried in the water-logged reducing zone. Given a cool Permian climate, microbial degradation of peat probably proceeded at a slow rate, and subaerial oxidative decomposition was possibly significant in the formation of inertinite-rich coals. Inundation by water, with even low oxygen (>8%), has also been postulated as a mechanism of peat oxidation.

Early Permian sequences. In the Early Permian marginal Sydney, Gunnedah and Bowen Basins, generally high-vitrinite coals are associated with deltaic or fluvio-deltaic sequences. Coal seams in a thick braided fluvial piedmont complex (Maules Creek Formation) in the Gunnedah Basin, are also generally vitrinite-rich, and the vitrinite content decreases up the sequence. The presence of high-vitrinite coals can be explained by high groundwater levels which may have been enhanced by the presence of a confining structural high down dip, and rapid burial in the quickly subsiding setting.

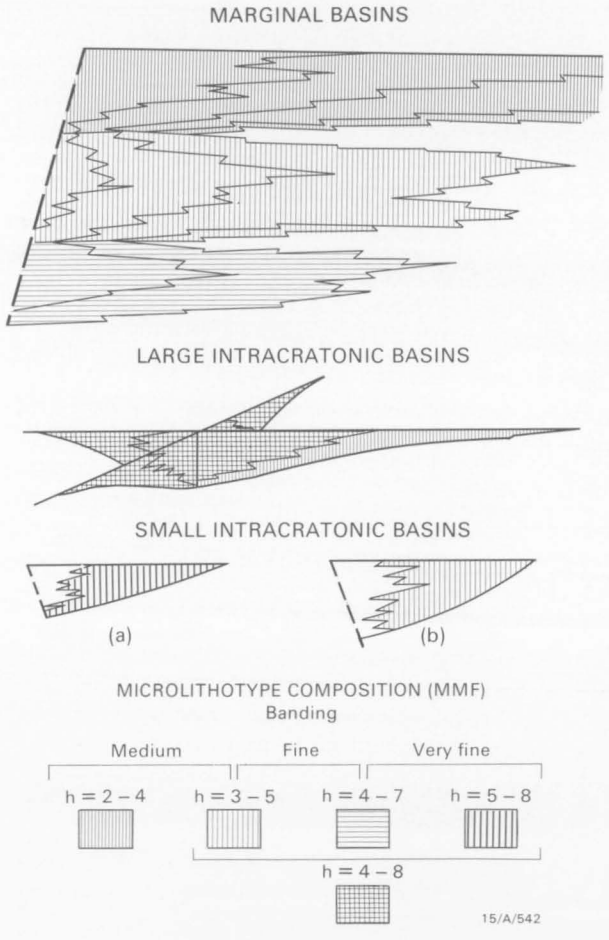


Fig. 24–7. Microlithotype banding of Late Permian seams in the marginal and intracratonic basins. Variation in the marginal basins reflects mainly the Sydney Basin; the large intracratonic basin is based on the Cooper, the small intracratonic (a) on the Oaklands, and the small intracratonic (b) on the Collie Basin.

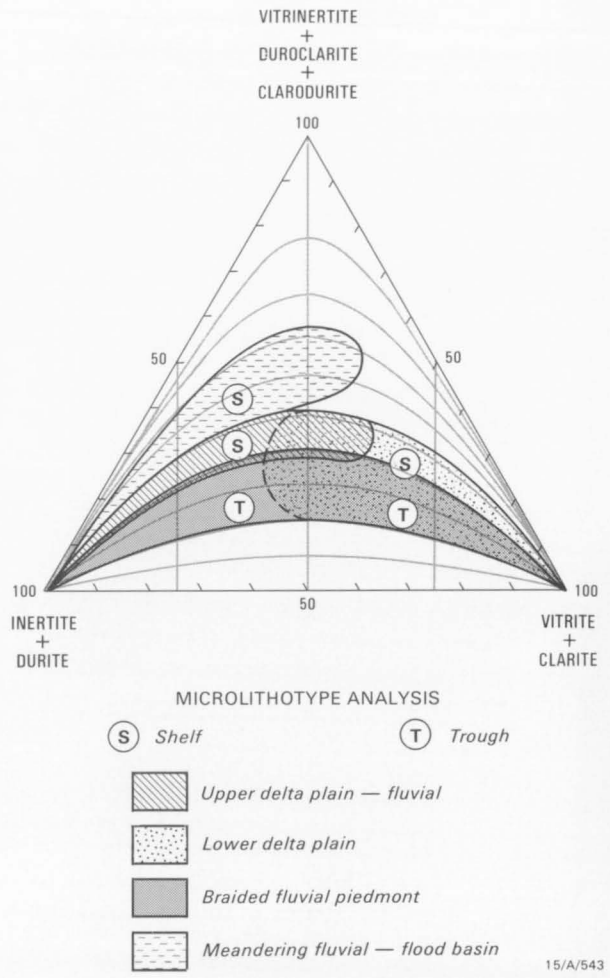


Fig. 24–8. Relationship between depositional environment and microlithotype composition of Late Permian seams.

Low-vitrinite seams, with high contents of both inherent mineral matter and sulphur (1–2% daf) are present along the base of several otherwise fluvio-deltaic sequences, including the Greta Coal Measures at Muswellbrook, the Leard and Maules Creek Formations in the southeast Gunnedah Basin, and the Collinsville Coal Measures and equivalents at Rugby in the Bowen Basin.

Within the large Early Permian intracratonic Cooper Basin, high-vitrinite coals (50–70% mmf) are associated with channel facies (Smyth, 1982) confined mainly to areas of greatest subsidence (Thornton, 1979); the better preservation of greater amounts of organic material reflects less water-table fluctuation away from the adjacent floor basins. Lower-vitrinite coals (15–55% mmf) are associated with adjacent overbank and swamp settings, where wide water-table fluctuations were probably more prevalent, leading to sub-aerial and sub-aqueous oxidation and/or deposition.

Low-vitrinite coals are also found in the Early Permian Blair Athol and Wolfang Basins. In these two basins, a thick (33 m) basal low-vitrinite (25% mmf) seam is present. Conditions required for the

formation of such seams are significant periods with no influx of detritus, a low ground-water table, sufficient rainfall to support the growth of the appropriate flora, and a cool climate to preserve the oxidised remains. Smyth (1980) has attributed the origin of the seam at Blair Athol to prolonged peat accumulation in a raised bog during a period of low clastic influx. In the Wolfang Basin, the thick seam is slightly higher in vitrinite than at Blair Athol, and is located farther down the Early Permian palaeoslope, possible reflecting high water-table levels basinwards. The upper seams in the Wolfang Basin are thin, with high-vitrinite contents, indicating a significant change in environment prior to the marine transgression at the end of the Early Permian.

Variations in the Early Permian vitrinite/inertinite ratio (Fig. 24–9) are presented on the Fig. 24–2 base, using data in Chapter 19. Variations in the marginal, large intracratonic, small intracratonic (a), and small intracratonic (b) basins reflect those in the Sydney/Bowen, Cooper, Blair Athol, and Ashford basins.

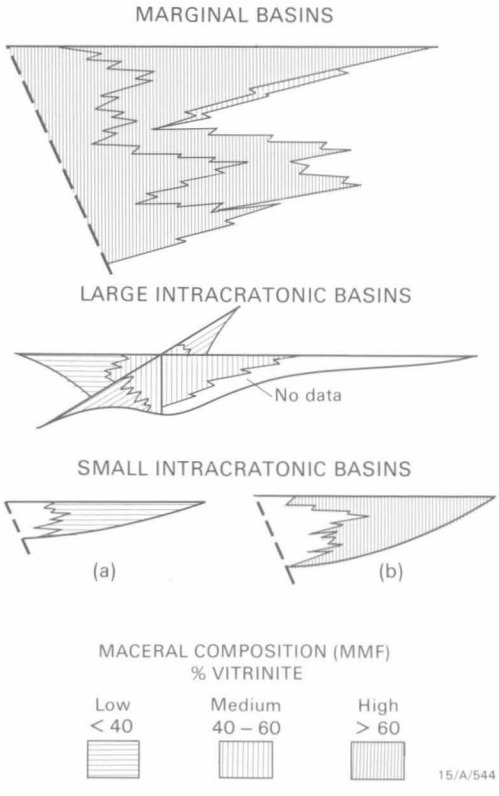


Fig. 24–9. Vitrinite content (mmf) of Early Permian seams in the marginal and intracratonic basins. Variations in the marginal basins reflect those in the Sydney and Bowen Basins, the large intracratonic basin is based on the Cooper, the small intracratonic (a) on the Blair Athol and the small intracratonic (b) on the Ashford Basin.

Late Permian sequences. In the Late Permian of the Sydney, Gunnedah and Bowen Basins, high-vitrinite coals are generally found in trough and shelf sequences of lower delta plain sediments formed after marine regression during early Late Permian. In general, they are transitional vertically with low to medium-vitrinite coals in upper delta plain and fluvial sediments. The situation is complicated, however, because of lateral interfingering of the environments, reflecting the effect of changes in relative sea level upon the flat-lying topography.

The high-vitrinite coals in the lower delta plain, with decreasing vitrinite up-slope, can be attributed simply to higher water-table levels in the distributive down-slope areas of the drainage system, with a lower and fluctuating water table up slope.

Of particular interest is a persistent low-vitrinite horizon (25% mmf) within the generally lower delta plain sediments of the Sydney and Gunnedah Basins (Bayswater seam horizon). It overlies a distinctive, burrowed sandstone throughout much of its range, and has been attributed to a shallow-water lacustrine environment with a peat composed of shrubs and grasses (Britten & Smyth, 1973). In the west of the Sydney Basin, the Lithgow seam is associated with proximal and distal piedmont deposits at the basin margin (Bembrick, 1981). Towards the Hunter Thrust, the Bayswater seam interfingers with piedmont deposits (Cameron & others, 1982). The equivalent Bowens Road seam in the Gloucester Basin occurs at the top of a deltaic section which overlies a shallow-marine unit (Lennox & Wilcock, 1985). A low-vitrinite horizon across most of the Sydney and Gunnedah Basins, in a sequence of otherwise high-vitrinite coals, suggests regional tectonic or eustatic controls; Hunt & others (1986) attribute it to subsidence in the basin axial regions, which lowered the water table in peat around the basin margins.

In the Late Permian, low and medium-vitrinite coals at the top of coal measures from the Sydney and Bowen Basins are found in a variety of palaeoenvironments, including upper delta plain, fluvial, and fluvial-piedmont deposits. In the Newcastle area of the Sydney Basin, low-vitrinite seams which formed on alluvial fans grade into high-vitrinite lateral equivalents, probably reflecting higher and less-fluctuating ground-water levels down dip from the fans and in interfan areas. In the southern Sydney Basin, a widespread low-vitrinite horizon (Bulli seam) in the top of the coal measures is underlain by delta sediments and overlain by distal braided fluvial deposits.

The few data available for Late Permain coals in the Cooper Basin indicate a low vitrinite content. Late Permian coals along the western edge of the Galilee Basin have an overall southwards increase in vitrinite from 30 to 60% (mmf), probably paralleling a transition from predominantly fluvial facies in the north to deltaic in the south.

The basal thick seam (Lanes Shaft seam) in the late Permian Oaklands Basin has a low-vitrinite content (30% mmf), and is petrographically very similar to the Big seam in the Early Permain Blair Athol Basin. Analysis of several seams in the small intracratonic Collie Basin shows them to be vitrinite-rich.

Figure 24–10, using the appropriate cross-sections of Fig. 24–3 and data from Chapter 19, displays the variations in the vitrinite/inertinite ratio for the Late Permian.

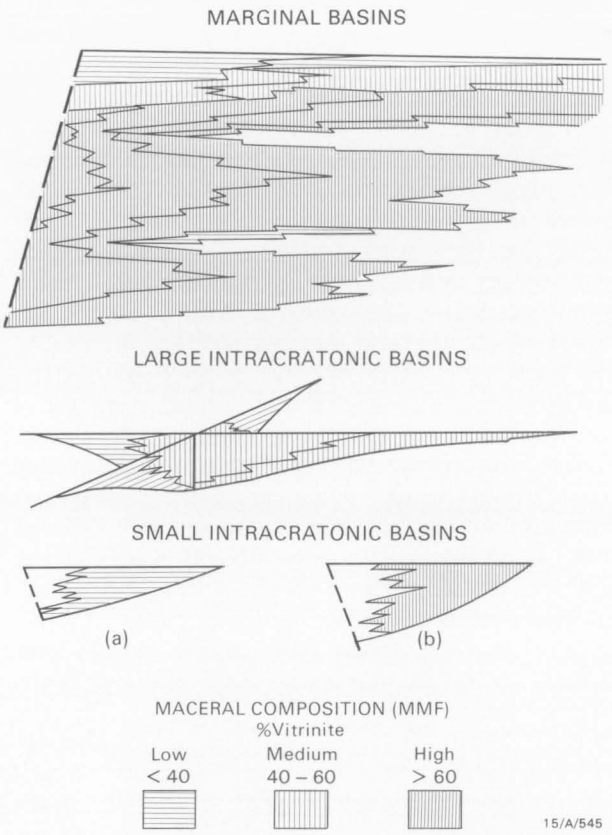


Fig. 24–10. Vitrinite content (mmf) of Late Permian seams in the marginal and intracratonic basins.

The "Semifusinite Ratio"

The division of the intertinite macerals into structured and non-structured (detrital) categories (semifusinite + fusinite, and inertodetrinite, respectively) is paralleled by the genetically similar classification of the vitrinite macerals (telinite and collinite), although the latter, which require etching of the coal samples, are not routinely identified. Where information is available for the Sydney Basin (Marchioni, 1982; Diessel, 1982), trends in the semifusinite ratio (semifusinite + fusinite: inertodetrinite) are paralleled by trends in the same direction, but of different magnitude, in the telinite/collinite ratio. A survey of published data for Canadian Carboniferous coals (Hacquebard & others, 1967; Hacquebard & Barss, 1970) reveals trends in both paralic and limnic basins similar to those in the Permian marginal and intracratonic basins, respectively. Exceptions are a high-collinite lagoonal paralic coal and sapropelic canneloid lacustrine coal. The latter has not been examined during this study, but several possible former types were discussed earlier.

Genetically, the semifusinite ratio is closely related to the parameter measured by Diessel (1982), who used the ratio of telinite + telocollinite + semifusinite + fusinite : alginite + sporinite + intertodetrinite.

Early Permian sequences. In the marginal basins, the braided fluvial Maules Creek Formation (Gunnedah Basin) and fan-delta Collinsville Coal Measures (Bowen Basin) contain coals with consistently medium semifusinite ratios. Coals in the fluvio-deltaic Greta Coal Measures (Sydney Basin) have a mainly low-semifusinite ratio, as does a single seam from the Clyde Coal Measures in a probable back-barrier setting.

The mainly fluvio-lacustrine sequence in the large intracratonic Cooper Basin has coals with chiefly low to very low semifusinite ratios, as does the small intracratonic Blair Athol, Wolfang and Ashford Basins.

Model cross-sections, analogous to those for the other coal parameters, and showing variations in the semifusinite ratio for the Early Permian, are presented in Fig. 24–11.

Late Permian sequences. The fluvio-deltaic sequences of the marginal Sydney and Bowen Basins have coals with mainly medium to high semifusinite ratios, although in the Bowen Basin the ratio decreases from the Baralaba Coal measures in the southeast, through the Rangal Coal measures in the centre, to the Bandanna Formation in the southwest. The Bowens Road–Hoskissons–Bayswater–Ulan–Lithgow–Woonona seam horizon in the Gloucester, Gunnedah and Sydney Basins (which has a characteristically low semifusinite ratio) is underlain by a basin-wide fine-grained highly bioturbated unit and a sparsely burrowed sandstone (Arkarula Sandstone Member, and Archerfield Sandstone Member in the Gunnedah and Sydney Basins, respectively) deposited during a regional marine transgression (Beckett & others, 1983; Britten & Smyth, 1973), and interfingers with braided fluvial sediments on the basin margins. An upper high-vitrinite ply of the Bayswater seam in Liddell Shaft DDHS1 (Britten & Smyth, 1973) shows a high semifusinite ratio, indicating an abrupt return to conditions which produced most of the underlying and

overlying seams. A genetically similar interval to the Archerfield Sandstone, deposited later in the Permian in the Sydney Basin at the base of the Newcastle Coal Measures (Waratah Sandstone), is overlain by a widespread seam (the Borehole) which is high in vitrinite with a medium to high semifusinite ratio.

Coals within mainly fluvial (fluvio-lacustrine?) sequences of the small intracratonic Oaklands Basin, and braided channel and overbank sediments of the small intracratonic Collie Basin, show low to very low semifusinite ratios. Coals in the large intracratonic Galilee Basin have medium semifusinite ratios in probable deltaic sediments in the south. However, the few data available in the Cooper Basin exhibit a low semifusinite ratio.

The Late Permian semifusinite ratio variations are given in the basin model sections of Fig. 24–12.

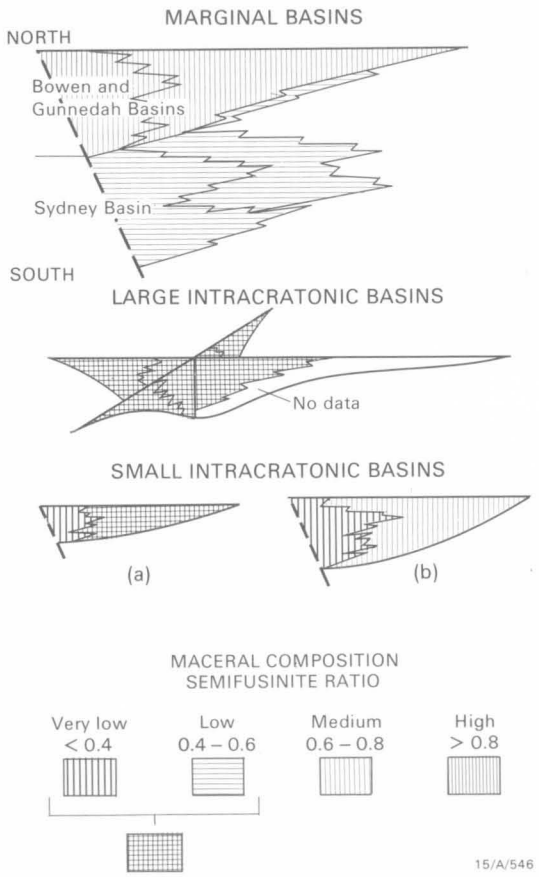


Fig. 24–11. The "semifusinite ratio" (mmf) of Early Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based on the Sydney and Gunnedah Basins, the large intracratonic on the Cooper, the small intracratonic (a) on the Blair Athol and Wolfang and the small intracratonic (b) on the Ashford Basin.

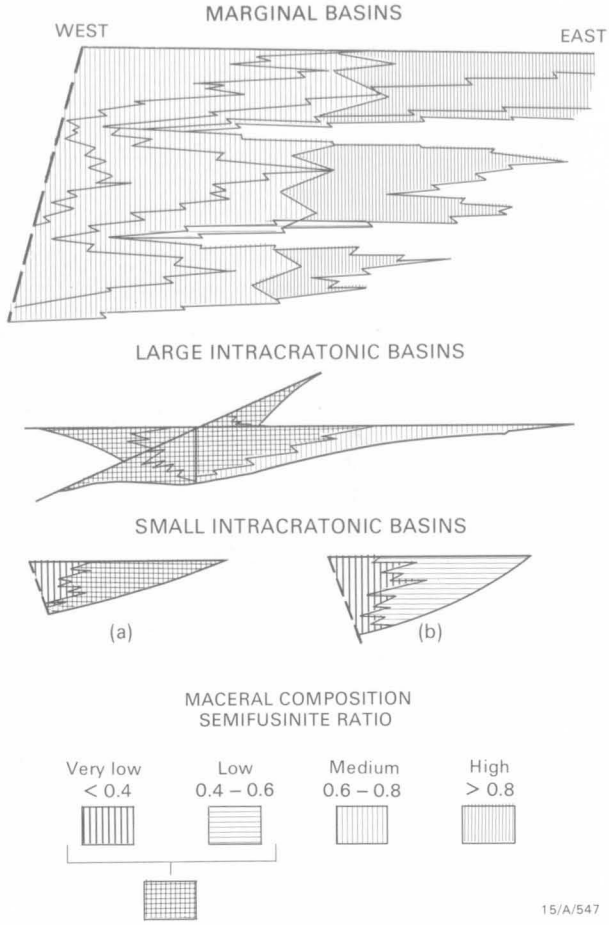


Fig. 24–12. The "semifusinite ratio" (mmf) of Late Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based on the Sydney and Bowen Basins, the large intracratonic basins on the Cooper and Galilee, the small intercratonic (a) basin on the Oaklands, and the small intracratonic (b) on the Collie Basin.

Petrographic Composition and Depositional Environment

The semifusinite ratio can be used to elucidate the problem of subaqueous versus subaerial deposition of peats ("wet" versus "dry" durites) discussed earlier in this chapter, because low-vitrinite coals with low and medium semifusinite ratios, equate to inertodetrinite and semifusinite-rich durites, respectively.

Early Permian sequences — marginal basins

The Greta Coal Measures at Muswellbrook and Cessnock contain coals ranging in vitrinite from 30 to 100% with mainly low semifusinite ratios. These seams formed probably in fan delta systems and are usually marine-influenced with a high sulphur content. The lower semifusinite ratios may indicate subaqueous deposition. The paralic (probably dominantly fan delta) Collinsville Coal Measures in the Bowen Basin cover the same range of vitrinite content but show medium semifusinite ratios, and the terrestrial Maules Creek Formation in the Gunnedah Basin has high-vitrinite coals with mainly medium but sometimes low semifusinite ratios.

The absence of high semifusinite ratios in the southern marginal basins supports the predominance of herbaceous varieties (*Gangamopteris*) in the Early Permian, as proposed by Retallack (1980), and also indicates a significantly diachronous succession of floras from north to south. The possibility of preserved lagoonal coals at the bases of the Greta Coal Measures at Muswellbrook, the Maules Creek Formation, Collinsville Coal Measures, and its equivalents at Rugby has already been mentioned. In all cases, these seams are high in ash, high in sulphur (>1% daf), high in disseminated mineral matter, and mainly with low semifusinite ratios. The relationship between geological setting and maceral composition for Early Permian coals is summarised in Fig. 24–13.

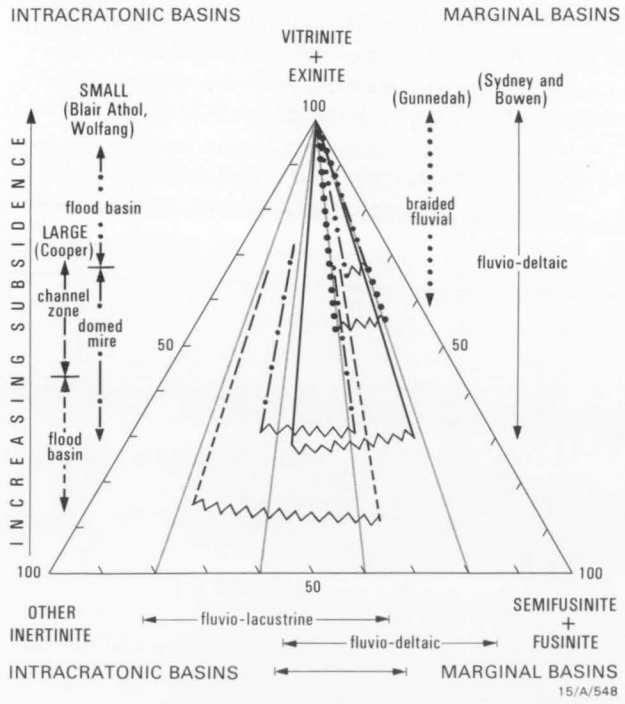


Fig. 24–13. Relationship between depositional environment, tectonic setting and maceral composition of Early Permian seams.

Late Permian sequences–marginal basins

Semifusinite-rich, high and low-vitrinite lithologies are dominant throughout most of the Late Permian marginal basins, with the exception of the Bayswater seam horizon. Low-vitrinite coals with high-semifusinite ratios would be assigned an oxidising sub-aqueous genesis by the European microlithotype classification and Smith (1962). However, in the Newcastle area of the Sydney Basin (Hunt & Hobday, 1984), the upper low-vitrinite coals are associated with alluvial fans deposited at the end of a basin-wide regressive cycle. The seams (Great Northern, Fassifern and Wallarah) consist of alternations of medium and low-vitrinite plies. At the basin margin, where they are intercalated with coarse braided-piedmont accumulations, they probably formed as secondary or tertiary peats restricted to areas of high groundwater flow, down dip from the fans during high sedimentation, and colonised the fans during low sedimentation periods. High-vitrinite seams are found in entirely terrestrial braided-fluvial sequences elsewhere in the basins (Maules Creek Formation and Baralala Coal Measures at Theodore), often reflecting high water-table levels in the highly porous, permeable and mineral-rich substrates. Subaqueous deposition of these low-vitrinite seams is not supported by their petrographic compositon, the overall regressive nature of the sediments, or their location on probable high relief along the basin margin.

On the southern shelf of the Sydney Basin, the petrographic profile of the Bulli seam at the top of the coal measures has been investigated by Shibaoka & Smyth (1975) the Shibaoka & Bennett (1976). The seam consists of three laterally persistent cycles of upward-decreasing vitrinite, terminated by mineral partings. The cycles were related to a sequence of arborescent flora which had formed a rheotrophic primary mire and culminated in a herbaceous ombrotrophic tertiary mire with subaerially oxidised inertinites, as based on the model proposed by Smith (1962). Subsequent flooding of the peat resulted in the deposition of a mineral-rich substrate, which favoured further formation of a rheotrophic primary peat. The incursion-phase durites of Smith (1962) are also dominated by semifusinite over inertodetrinite. Although it is possible that the high to low-vitrinite cycles represent transition from primary to tertiary peats, they probably do not mark major vegetational changes, because of the predominance of wood-derived inertinite throughout. Laterally persistent low-vitrinite seams in the stratigraphically and depositionally analogous upper part of the Rangal Coal Measures in the north of the Bowen Basin are also characterised by medium semifusinite ratios.

Within the chiefly deltaic sequences, typical of the lower part of the Late Permian, mainly medium and high semifusinite ratios are known,

and seam cycles consist principally of alternating high and medium vitrinite coals (Smyth, 1970), probably representing rheotrophic primary and secondary peats, formed from arborescent and mixed, predominantly woody, floras. A subtle decrease in semifusinite ratios from high in the east to medium in the west is apparent in the Bowen Basin and may reflect floral zonations in response to a maritime-influenced climate to the east. The relationship between geological setting and maceral composition of the Late Permian coals is summarised in Fig. 24–14.

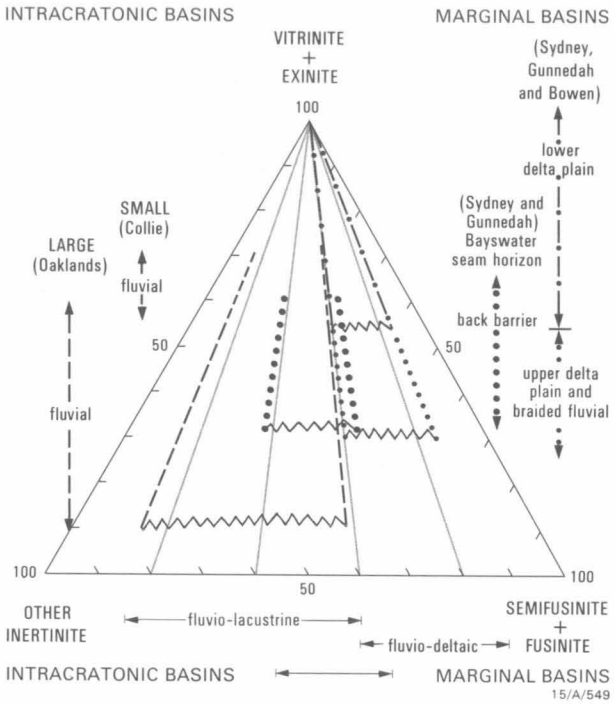


Fig. 24–14. Relationship between depositional environment, tectonic setting and maceral composition of Late Permian seams.

Bayswater seam horizon

The Bayswater seam horizon near the base of the upper coal measures occupies a unique position in the stratigraphy of the Gunnedah, Gloucester and Sydney Basins, and is an almost basin-wide stratigraphic marker. The seam is low in vitrinite, but the Hoskissons, Bowens Road, Bayswater and Ulan seams usually have a high-vitrinite basal ply (Britten & Smyth, 1973; CSIRO, 1977). The average semifusinite ratio of seams is low to very low and exhibits no variation in the high-vitrinite (50%) or low-vitrinite (5%) plies except at the base of the Bowens Road seam (Hunt & others, 1983). One profile of the Bayswater seam reported in Britten & Smyth (1973) reaches a thickness of approximately 10 m and has a high-vitrinite upper section with a medium semifusinite ratio. The top of the seam is separated by 3 m from the first overlying high-vitrinite seam.

Britten & Smyth (1973) propose a lacustrine or lagoonal setting for the Bayswater seam in the northern Sydney Basin, based on the environment of the substrate, which consists of a burrowed laminite-sandstone. This substrate, which also extends throughout the Gunnedah Basin, is laterally equivalent to burrowed, fine-grained marine or estuarine sediments overlain by barrier deposits in the east of the Sydney Basin. The equivalent seam in the west (Lithgow seam) interfingers with alluvial fan deposits along the basin margin, but probably overlies barrier sands basinwards. The Bowens Road seam is also intercalated with probable alluvial fan sediments and overlies a deltaic and shallow-marine section. Outside the Gloucester Basin, the horizon is exceptional because of the absence of the usual deltaic sedimentary pattern, which characterises other regressive phases in the basins; the retreat of the sea may have been eustatically controlled. However, a genetically comparable interval higher in the sequence, which also culminates in a widespread barrier sand (Watts and Waratah Sandstones), is, however, overlain by a high-vitrinite seam with a medium to high semifusinite ratio (Borehole seam).

The low semifusinite ratio in the seams was interpreted as evidence of a poorer herbaceous flora by Britten & Smyth (1973), which may have been compounded by a reduced nutrient input because of lower sediment influx. Hunt & others (1986), however, found no evidence for a significant difference in flora between the Bayswater and other seams in the adjacent sequence, and attributed the high inertinite content of the Bayswater seam to tectonically induced lowering of the water table during the accumulation of the precursor peat. Debris flow deposits on the basin margin (Uren, 1985) suggest central basin subsidence contemporaneous with the horizon, leading to water table lowering, oxidation, reworking and redeposition of the peat around the basin rim. Vitrinite-rich basal plies in other situations have been explained by initial peat formation below the water table, followed by subsequent subaerial "in situ" oxidation producing a durite with a medium to high semifusinite ratio.

A high percentage of inherent mineral matter (15–20%) distinguishes the inertodetrinite-rich durites of the Bayswater seam and its correlatives from the inertodetrinite-rich durites of the ombrotrophic tertiary domed mires (Blair Athol) that have a lower inherent mineral matter (5–15%), as discussed in the next section. The high inherent mineral matter is further evidence of limited transportation of the inertinite and mineral matter fractions (mainly clay) by either wind or water.

Early and Late Permian sequences–intracratonic basins

Large intracratonic basins. Coals in the intracratonic basins are characterised by mainly low-vitrinite contents, low semifusinite ratios, and generally finely banded microlithotypes (Hunt, 1982). Within the large intracratonic Cooper Basin, both Early and Late Permian coals show low to very low semifusinite ratios, although only a few Late Permian coals have been examined. Some Early Permian coals, located on the edge of the Patchawarra Trough, have medium to high semifusinite ratios, and coals from the centre of the Patchawarra Trough have low semifusinite ratios, irrespective of depositional environment — whether channel zone or flood basin setting. If the characteristics of modern inland basins in terms of sedimentary environment, peat-type and groundwater conditions (Walker, 1970) are applied to the Cooper Basin, then mainly fluvio-lacustrine sedimentation can be expected. Periodic flooding and dessication, particularly in the flood basin areas adjacent to channel zones, would give rise to hydroserial successions with peats formed dominantly from "reedy" and herbaceous vegetation. Peats would then be exposed to oxidative subaquatic decomposition depending on the edaphic conditions of the lake system as well as occasional oxidative subaerial decomposition. Evidence for large-scale fluctuation of the groundwater table may be provided by the "band macrinite", previously discussed. Within the channel zone, high-vitrinite coals were formed under less-fluctuating groundwater; the low semifusinite ratio of the channel zone coals suggesting hypautochthonous deposition or a generally herbaceous/reedy vegetation (or both). Accumulation in the flood basin could range from autochthonous to allochthonous, and the few high semifusinite, high-vitrinite seams on the edge of the Patchawarra Trough may indicate rarer rheotropic, minerotrophic peats forming along the basin margin.

Small intracratonic basins. The Ashford and Collie Basins contain high-vitrinite coals with medium and low semifusinite ratios, respectively, whereas the small intracratonic Oaklands, Blair Athol and Wolfang Basins have low-vitrinite coals with low semifusinite ratios. The high-vitrinite seams have from 5 to 12% ash and are 2 to 12 m thick. The low-vitrinite seams contain 5–8% ash and reach thicknesses over of 40 m.

Sedimentation in the Collie Basin and, probably, in the Ashford Basin, was essentially braided-fluvial, with fluvio-lacustrine and peat-forming environments with low rates of sedimentation (Park, 1982). The coal types are very similar in both microlithotype and maceral composition, and probably reflect peat formed from a woody vegetation within relatively stable and sufficiently high groundwater regimes. The inertodetrinite could be hypauchthonous in origin representing material derived from the marginal areas where greater fluctuation in groundwater conditions would occur, similar to the situation described for South African coals by Snyman (1961).

Coals in the Blair Athol, Wolfang and Oaklands Basins are notable because of their low vitrinite contents, fine banding (Smyth, 1980) low mineral matter contents, and their great thicknesses. Given the reduction of the original peat thickness due to oxidation, the small amount of the mineral matter is remarkable. Smyth (1980) has proposed that the above seams formed as "raised bogs", probably analogous to modern concentric domed mires (Moore & Bellamy, 1974). These mires typically consist of a convex peat mass comprising an ombrotrophic tertiary peat cupola, overlying an initially rheotrophic primary basal peat section. The high-vitrinite basal section of the Big seam equivalent in the Wolfang Basin is evidence of the colonising primary peat. The height to which the cupola rises is limited by the regional precipitation/evaporation balance, which may be enhanced by freezing during dry winter months, in high altitudes or latitudes. Geologically, a 40 m-thick peat also requires constant low sedimentation rates over a long period. Both the basal higher-vitrinite section in the Wolfang Basin (12 m thick) and the main low-vitrinite section (27 m thick) show low semifusinite ratios. However, a 2 m-thick mineral parting in the top of the seam is overlain by 3 m of high-vitrinite coal with a medium semifusinite ratio, indicating a marked change in edaphic conditions and a return to rheotrophic woody peat forming on the new mineral substrate. This pattern is maintained in other thin, high-vitrinite seams overlying the thick seam.

Phosphorus Content

Phosphorus content was referred to in Chapter 21 as high, medium and low using a technological classification, which largely coincides with the natural phosphorus distribution in the Permian coals. Phosphorus content is, however, "patchy", and areas which are characterised by high phosphorus in fact range from low to high, and medium phosphorus coals from low to medium.

Early Permian sequences

Coals in mainly deltaic situations in the Early Permian marginal basins usually show high phosphorus contents. The basal seams in several locations have the highest phosphorus (Fig. 21–11), and these seams overlie and interfinger with marine strata. The upper seam of the Greta Coal Measures at Cessnock (Fig. 21–12), which was subject to marine influence soon after deposition,

also has a high phosphorus content. However, the Homeville and Tangorin seams, which on the basis of their sulphur content (Chapter 20) are also marine influenced, show only medium phosphorus concentrations.

The entirely terrestrial sequence in the northeast of the Gunnedah Basin, and the small intracratonic Blair Athol and Wolfang Basins (Fig. 21–11), have only low and medium phosphorus. The terrestrial sequence in the small intracratonic Ashford Basin has a medium to high phosphorus content on the basis of two samples.

Variations in Early Permian phosphorus content (Fig. 24–15) are presented on the Fig. 24–2 base, using data in Chapter 21.

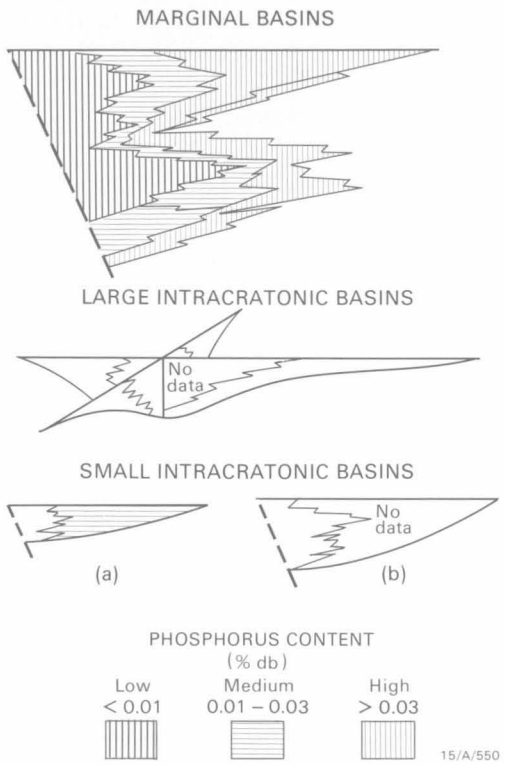


Fig. 24–15. Phosphorus content (% db) of Early Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based on elements in the Bowen, Gunnedah and Sydney Basins, and the small intracratonic (a) on the Blair Athol and Wolfgang intracratonic basins.

Late Permian sequences

The base of the sequences in the Late Permian marginal basins has mainly high-vitrinite coals deposited on a lower delta plain. Where marine influence was greatest, i.e., in the German Creek Formation (Bowen Basin, Fig. 21–13) and Tomago Coal Measures (Sydney Basin, Fig. 21–16), phosphorus content is also highest. Westward, through the Wittingham Coal Measures (Sydney Basin, Fig. 21–15), phosphorus is generally lower. No data are available for coal in the basal marine-influenced portion of the Illawarra Coal Measures (southern Sydney Basin). However, seams deposited at the base of a subsequent transgressive episode (Tongarra and Irondale, Fig. 21–17) are high in phosphorus.

The middle of the Late Permian sequence in the Bowen Basin (Fair Hill and Burngrove Formations, Fig. 21–13) has low to medium-phosphorus coals, although a mainly lower delta plain setting persisted. In the southern Sydney Basin, where data are available for the same part of the probably genetically equivalent sequence, low-phosphorus seams (Wongawilli and Middle River, Fig. 21–17) were also formed at the top of a lower delta plain sequence. The partly equivalent section of the Wittingham Coal Measures (Jerrys Plains Subgroup, Fig. 21–15) contains chiefly low to medium-phosphorus coals. Seams in the partly equivalent base of the Newcastle Coal Measures (Fig. 21–16) show a mainly high phosphorus content, although the middle of the sequence has not been sampled. Data are not available for the Gunnedah Basin.

The top of the Late Permian sequences coincides with a return to high-phosphorus coals in sedimentary environments described mainly as fluvial (Figs 21–13 and 17), with notable exceptions in braided-fluvial settings in the Newcastle Coal Measures (Fig. 21–16) and southern Baralaba Coal Measures (Fig. 21–23).

Phosphorus content for the thick seam deposited under fluvial conditions in the small intracratonic Oaklands Basin, is low (Fig. 21–15). Phosphorus content along the eastern edge of the large intracratonic Galilee Basin is geographically patchy, but the more "deltaic" section in the south is high in phosphorus, whereas the more "fluvial" section in the north has a low phosphorus component (Fig. 21–24).

Figure 24–16, using the appropriate cross-sections of Fig. 24–3 and data from Chapter 21, shows the variation in the phosphorus content for the Late Permian basins.

Ash Content

In Chapter 22, ash content and composition of coals in the Permian basins were discussed. The relationship of contained ash to sedimentary environment is not clear because of the presence of varying amounts of "secondary" mineral matter, often of volcanic origin. In some situations, where the contribution of secondary mineral is small, ash content may provide insight into palaeoenvironments. Several examples were discussed in the

previous section on petrographic composition and depositional environment. However, because of the generally obscure relationship no attempt has been made to provide a model for ash variability.

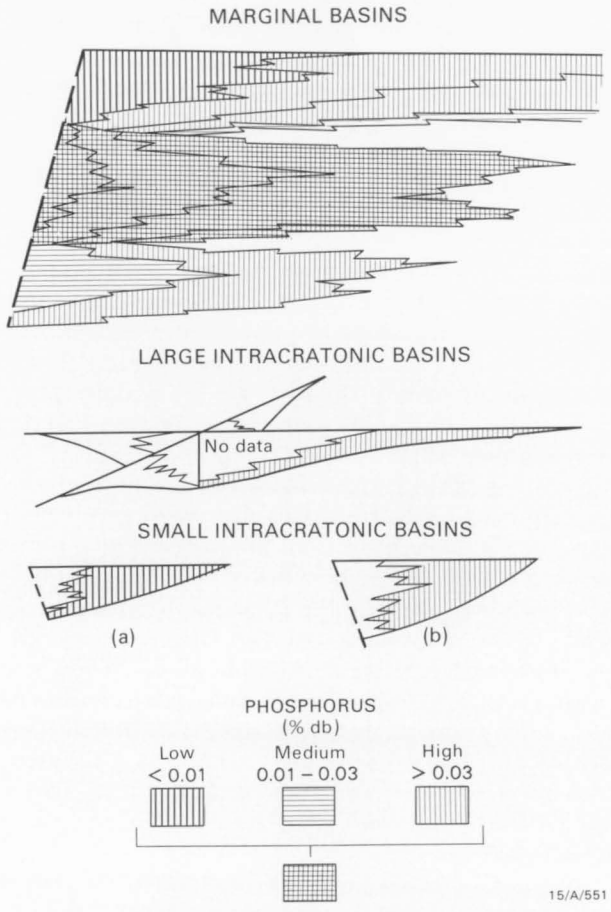


Fig. 24–16. Phosphorus content (% db) of Late Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based mainly on the Bowen and southern Sydney Basins, and the small intracratonic (a) on the Oaklands Basin. Insufficient data exists to produce generalisations for the large intracratonic and small intracatonic (b) basins.

Ash Composition

The SiO_2/Al_2O_3 ratio of coal ash, mainly in the Late Permian of the Sydney Basin, was discussed in relation to stratigraphic position and environments by Shibaoka (1972). However, in the Bowen Basin, coals of the same general age and depositional facies show different ash compositions (e.g., German Creek Formation and Rangal Coal Measures). It is possible that the pattern of silica enrichment, described by Shibaoka (1972) for Sydney Basin coals, is due to the presence of silica introduced after coal formation (Botz et al., 1986).

Nevertheless, if high-silica ashes are assumed to be due to secondary mineralisation, as suggested by their random occurrence across a range of environments, then some observations can still be made on the association between environment and ash composition.

Early Permian sequences

In the marginal basins, coals, which on the basis of sulphur content are considered to be marine-influenced, particularly the Tangorin seam (Cranky Corner Basin) and an unnamed seam in the Maules Creek Formation in DMR Howes Hill DDH 1 (Gunnedah Basin), have very low SiO_2/Al_2O_3 ratios. The remaining fluvio-deltaic seams show low and medium SiO_2/Al_2O_3 ratios, excluding high-silica ashes. In the small intracratonic Blair Athol Basin, the Big Seam, enclosed in fluvial sediments, has a medium SiO_2/Al_2O_3 ratio. The small intracratonic Ashford Basin contains a seam with a low SiO_2/Al_2O_3 ratio, deposited in a fluvial setting.

Generalized cross-sections showing variation in ash composition for Early Permian coals (Fig. 24–17) are based on data from Chapter 22.

Late Permian sequences

The marginal Sydney Basin has a trend of high SiO_2/Al_2O_3 ratios in the basal deltaic seams to medium and high ratios in the upper fluvial seams. However, in the Bowen Basin, the basal deltaic seams have low SiO_2/Al_2O_3 ratios in the more marine-influenced sections and, medium ratios updip. At the top of the Bowen Basin sequence, fluvial coals show mainly low and medium SiO_2/Al_2O_3 ratios, with an irregular zone of high silica ashes to the west.

In the large intracratonic Galilee Basin, the basal seams include seams (E and F) with low and medium SiO_2/Al_2O_3 ratios, formed probably under fluvial conditions. The upper seams have high silica ash contents throughout, irrespective of palaeoenvironment.

The small intracratonic Oaklands Basin has a thick seam with a low SiO_2/Al_2O_3 ratio deposited in a fluvial setting.

Data from Chapter 22 were used to construct the diagrammatic cross-sections displaying the variarion in SiO_2/Al_2O_3 ratio for the Late Permian coals (Fig. 24–18).

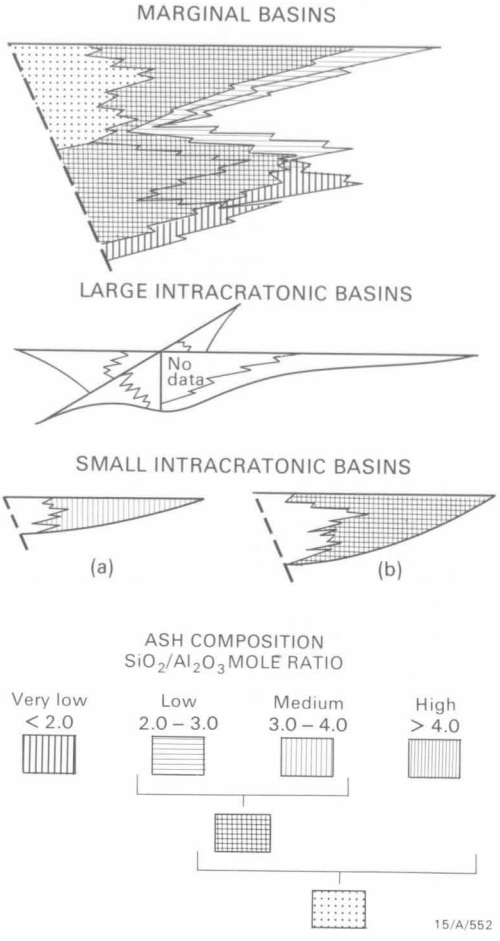


Fig. 24–17. Ash composition ($Si0_2/A1_20_3$ ratio) of Early Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based on the Sydney and Gunnedah Basins, the small intracratonic (a) on the Blair Athol, and the small intracratonic (b) on the Ashford Basin.

Sulphur Content

In Chapter 20, sulphur content is divided into high, medium and low by categories which coincide closely with the variation observed in different palaeoenvironments. The sulphur contents are those of either clean-coal composites or 1.60 relative density float-fraction composites; the sulphur in raw coal is greater for the medium and, particularly, for the high-sulphur categories.

Early Permian sequences

In the Early Permian marginal basins, mainly high-sulphur coals were formed in conditions described as "deltaic", but these may also include other paralic environments — probable fan delta (Sydney Basin), and barrier–lagoonal (Sydney and Gunnedah Basins). Because the Early Permian sequences are overlain by transgressive marine sediments, secondary enrichment of sulphur derived from marine sulphate is apparent in the tops (Greta and Collinsville Coal Measures).

Fluvial sequences in the northeast of the Gunnedah Basin and the intracratonic Blair Athol and Wolfang Basins have mainly low-sulphur seams.

The variation in Early Permian sulphur (Fig. 24–19) content based on data in Chapter 20, is presented on the same model sections as those of Fig. 24–2.

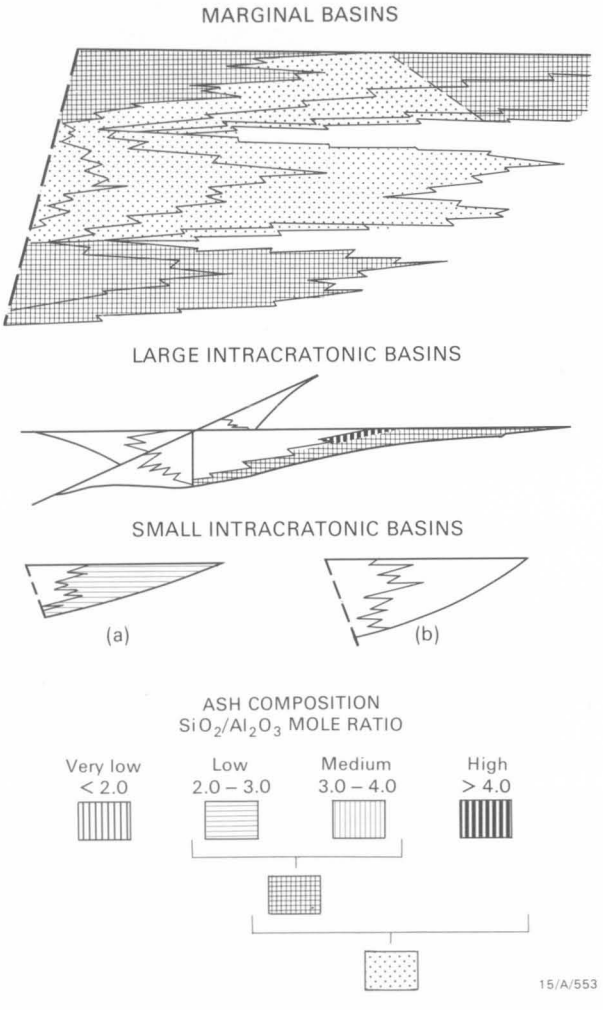


Fig. 24–18. Ash composition ($Si0_2/A1_20_3$ ratio) of Late Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based on the Sydney and Bowen Basins, the large intracratonic on the Galilee, and the small intracratonic (a) on the Oaklands Basin.

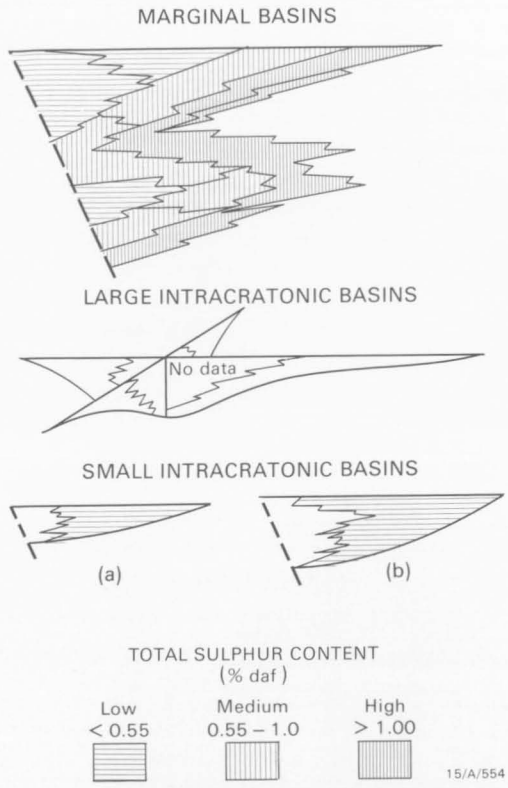


Fig. 24–19. Total sulphur content (% daf) of Early Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based on the Sydney, Gunnedah and Bowen Basins, the small intracratonic (a) on the Blair Athol and Oaklands, and the small intracratonic (b) on the Ashford Basin.

Late Permian sequences

The Late Permian marginal basins have mainly high and medium-sulphur basal coals coinciding with maximum marine influence. Subsequent sporadic, limited incursions also are marked by medium to high-sulphur coals, particularly near the Macmillan Formation, which interfingers with the German Creek Formation and Moranbah Coal Measures in the Bowen Basin, and near the Bulga and Denman Formations and their equivalents at the base and middle of the sequences in the Sydney, Gunnedah and Gloucester Basins.

In the Sydney and Gunnedah Basins, frequent progradation of alluvial fans from the bounding Hunter–Mooki Thrust System in the northeast resulted in the vertical juxtaposition of low-sulphur coals on the fans and medium-sulphur coals formed in deltaic facies.

The top of the late Permian sequences are usually marked by regressive fluvial and braided-fluvial sediments, with associated low-sulphur coals particularly towards the basin margins. The centres of the basins have medium-sulphur coals at the top of the sequence. This may be due to remnant deltaic facies in the basin centres. The possibility that erosion has exposed older, medium-sulphur coals, especially in the Sydney Basin, cannot be discounted because of poor stratigraphic and palynological control. Limited data suggest a patchy, medium to high-sulphur horizon in the latest Permian of the central and southeastern Bowen Basin and Gunnedah Basin. Although no study of depositional environments has been made at this level, the correlation between environment and sulphur content just discussed may indicate a further limited marine incursion followed by erosion in the top of the Permian.

Sulphur content in the large intracratonic Galilee Basin is mainly low in the probably more fluvial areas in the northeast, and medium in the more deltaic ones in the southeast. The small intracratonic Oaklands Basin has a thick low-sulphur coal deposited in fluvial conditions, and the small intracratonic Collie Basin contains both low and medium-sulphur coals in a fluvial setting.

Late Permian sulphur content variation, using the appropriate data from Chapter 20, and the cross-sections of Fig. 24–3, is given in Fig. 24–20.

Sulphur Content, Petrographic Composition and Depositional Environment

The majority of Australian Permian coals can be simply characterised as either high-vitrinite, medium-sulphur coals formed in a delta, or low-vitrinite, low-sulphur coals that originated in a fluvial sedimentary setting. However, several instances of low-vitrinite, high-sulphur coals formed in paralic regimes, and high-vitrinite, low-sulphur coals in fluvial environments have been documented. Figure 24–21 summaries the relationship between vitrinite content, sulphur content and depositional setting based on all available data. The boundaries, using sulphur content to delineate sedimentary environment, have been adjusted to account for the dependence of sulphur on the proportion of vitrinite discussed in Chapter 20.

Finally, taking the hypothesis that the sulphur content of coal reflects levels of sulphate available during the formation of peat (allowing for variation in petrographic composition), and using the correlations of low sulphur with entirely fluvial systems, low to medium sulphur with upper delta plain–fluvial facies, and high sulphur with lower delta plain–marine systems, one can propose palaeogeographies for various Permian horizons using sulphur distribution data. Some support for

this is given by the $^{34}S/^{32}S$ isotopic ratio of the Permian coals in relation to depositional environment (Hunt and Smith, 1985).

Early Permian sequences

Middle coal measures. In the Bowen Basin region, low-sulphur coals formed in raised peat bogs under fluvial conditions in isolated upland depressions (Blair Athol Coal Measures in the Blair Athol and Wolfang Basins). These topographic lows appear to have been located on the axis of the drainage system along the northern extension of the Denison Trough. The low-sulphur coals grade laterally into medium and high-sulphur coals formed in deltaic, fan-deltaic and other paralic environments (Aldebaran Sandstone and Collinsville Coal Measures) (Fig. 24–22).

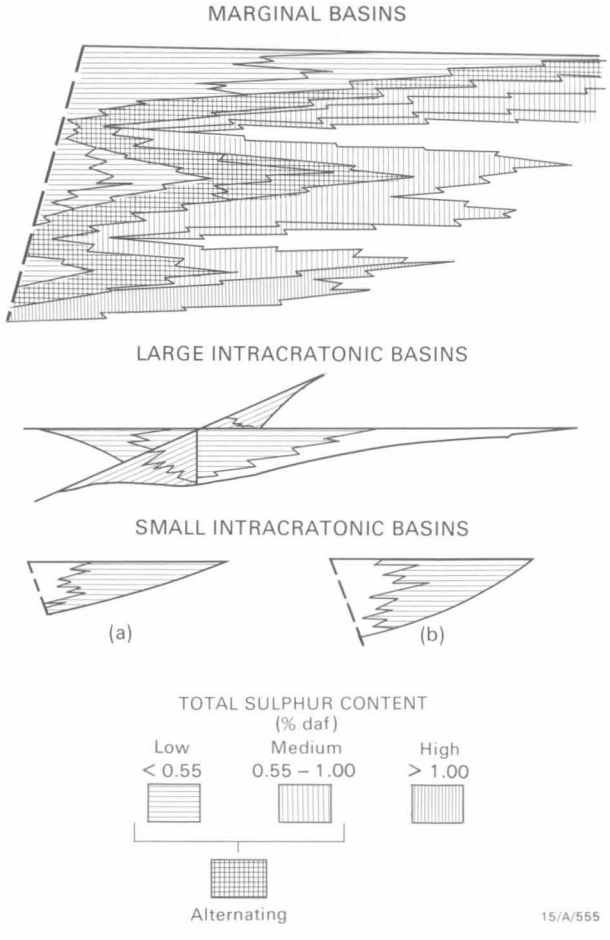


Fig. 24–20. Total sulphur content (% daf) of Late Permian seams in the marginal and intracratonic basins. Variation in the marginal basins is based mainly on the Sydney and Bowen Basins, the large intracratonic on the Galilee, the intracratonic (a) on the Oaklands and the small intracratonic (b) on the Collie Basin.

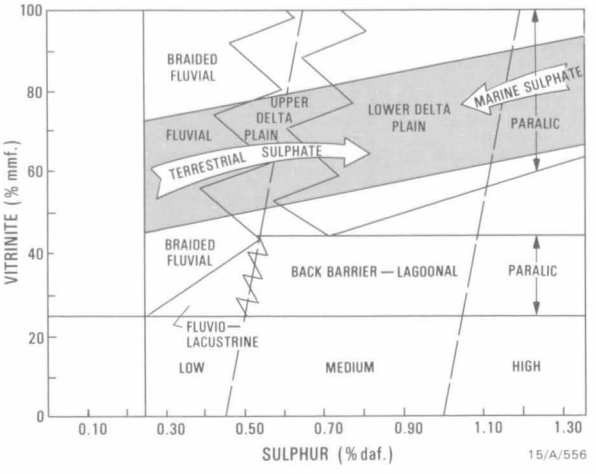


Fig. 24–21. Relationship between depositional environment, total sulphur content, and vitrinite content of seams in the Permian basins.

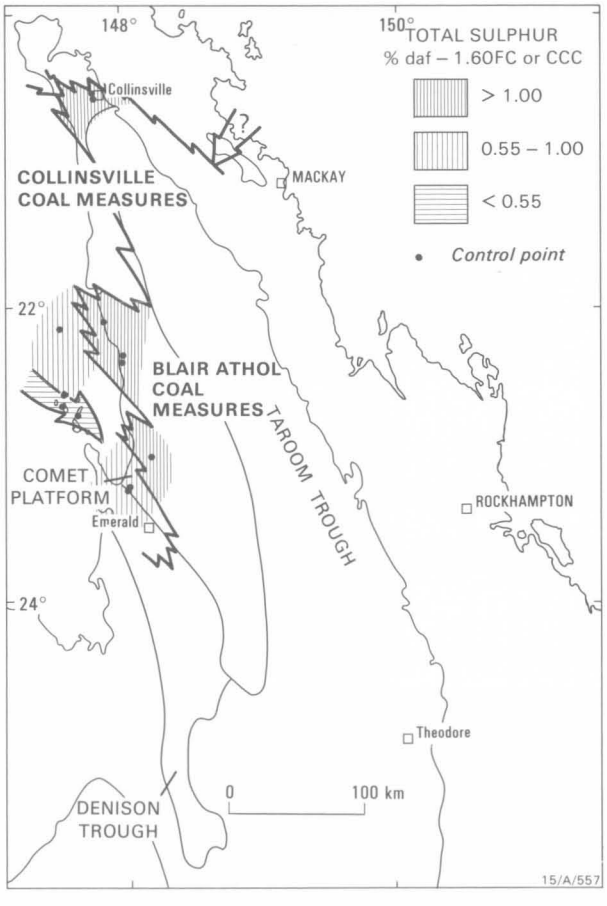


Fig. 24–22. Early Permian palaeogeography of the Bowen, Blair Athol and Wolfang Basins based on total sulphur content of seams in the Collinsville and Blair Athol Coal Measures.

High-sulphur coals in the Sydney Basin (Clyde Coal Measures and Greta Coal Measures) are generally juxtaposed with marine strata, having accumulated in fan-delta complexes (Fig. 24–23).

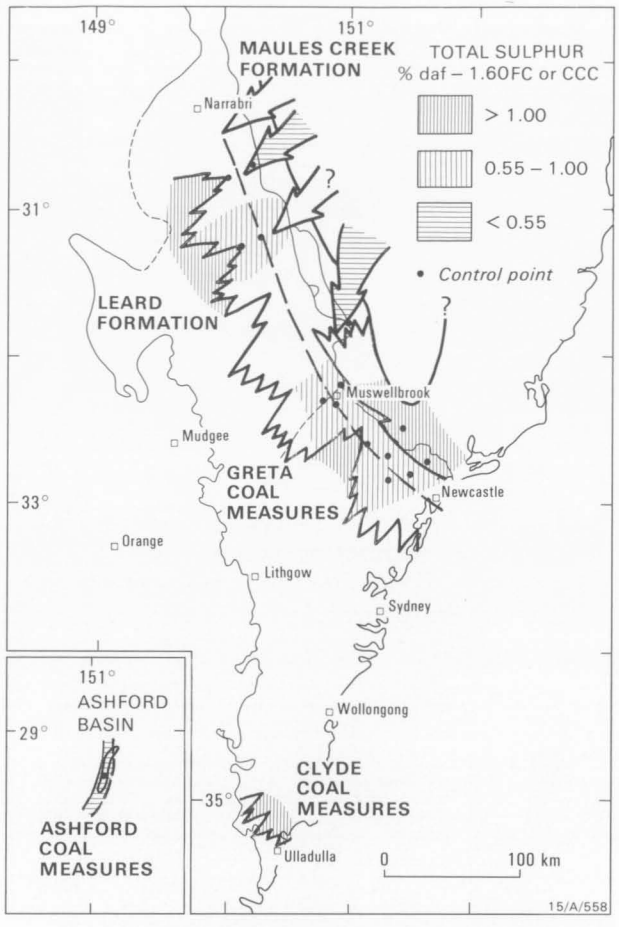


Fig. 24–23. Early Permian palaeogeography of the Gunnedah, Sydney and Ashford Basins based on total sulphur content of seams in the Maules Creek and Leard Formations and the Ashford Coal Measures.

The Greta coals grade up-fan into medium-sulphur coals formed under less saline conditions. However, at Cranky Corner and in the East Maitland 1 bore high-sulphur coals may indicate paralic conditions in a postulated trough adjacent to and paralleling the Hunter–Mooki Thrust. This trough may have allowed ingress of the sea as far north as the area west of Ashford in pre-Greta time. Only two high-sulphur coals are known in the Gunnedah Basin, one from the Leard Formation and one from an undifferentiated section in the Leard and Maules Creek Formations (Howes Hill DDH1). They were deposited in a fluvial system, but are separated by only a short interval from overlying marine rocks from which marine sulfate may have infiltrated. The Maules Creek Formation itself contains low-sulphur coals emplaced in a fluvial environment which became more deltaic in character with time.

Late Permian sequences

Lower part of upper coal measures, excluding Bayswater horizon. The stratigraphic extent of this sequence is shown in Table 24–1. (The petrographically distinctive coals of the Bayswater seam horizon, interbedded in this sequence, are considered separately in the following section.)

These coals in the Bowen Basin (mainly the German Creek Formation and Moranbah Coal Measures) are chiefly medium-sulphur types which grade southeasterly to high-sulphur coals (Fig. 24–24). This reflects a change down the palaeoslope from fluvial and upper delta dominance to lower delta regimes. Holmes (1983) has also recognised barrier and back-barrier facies. Marine incursions have not generally resulted in high-sulphur coals, with the exception of some thin seams, probably because of flushing by large fresh-water stream flows.

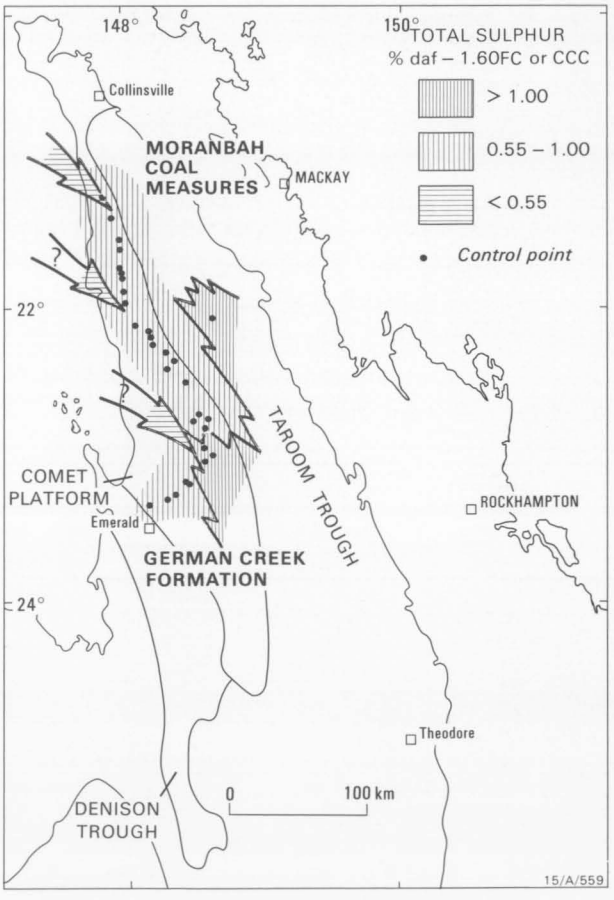


Fig. 24–24. Palaeogeography of the lower part of upper coal measures, Bowen Basin, based on total sulphur content of seams in the Moranbah Coal Measures and the German Creek Formation.

In the Sydney and Gunnedah Basins, coal aggradation in this sequence began earlier than in the Bowen Basin. Most of the region has medium-sulphur coal, but there are interbedded medium and low-sulphur seams along the eastern margins of the basins (Fig. 24–25). Coal was deposited mainly on a lower delta plain in the south, west and centre, but along the eastern margins upper delta plain to fluvial regimes were sporadically established also, as a result of intermittent shedding of detritus from uplifted highlands in the New England Fold Belt and the bordering eastern Sydney Basin rim. The Gunnedah Basin, being more proximal, was affected by this trend to a greater extent than the Sydney Basin.

The medium-sulphur coals in the Gloucester Basin suggest some brackish influence in a lower delta plain, despite predominant fluvial and alluvial fan deposition.

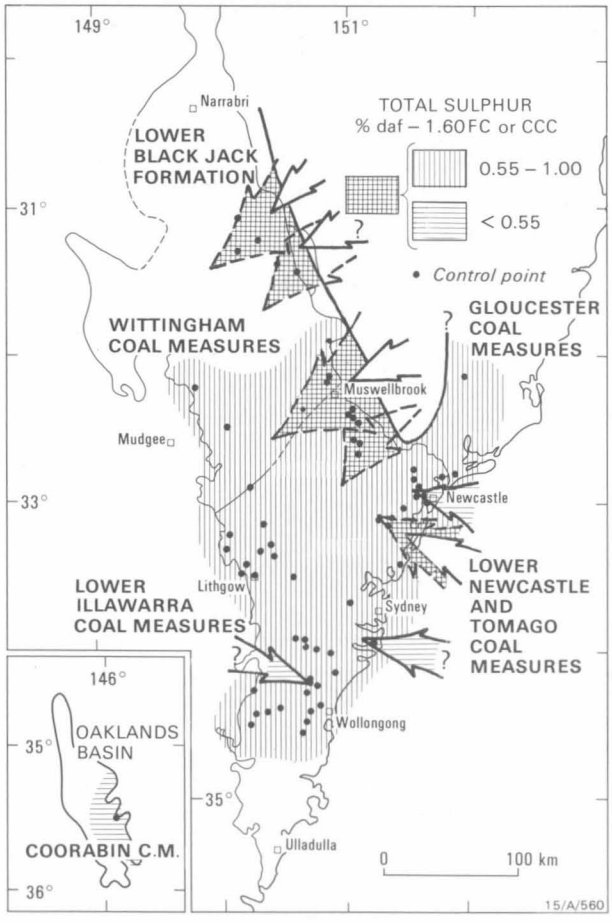


Fig. 24–25. Palaeogeography of the lower part of upper coal measures, Gunnedah, Sydney, Gloucester and Oaklands Basins, based on total sulphur content of seams in the Black Jack Formation and the Wittingham, Tomago, lower Newcastle, Illawarra, Gloucester and Coorabin Coal Measures.

The Oaklands Basin, however, saw meandering stream sedimentation in an intracratonic setting, and the coals of the Coorabin Coal Measures are correspondingly low in sulphur.

Bayswater seam horizon. The distinctive inertinite-rich coals of this thin unit occur only in the Sydney, Gunnedah and Gloucester Basins (Fig. 24–26). Sedimentation in the Bowen Basin was still marine at the time. The petrographically distinctive composition, over such a large area, was probably due to tectonic subsidence in the eastern Sydney Basin lowering water tables in the surrounding peatlands (Hunt & others, 1986).

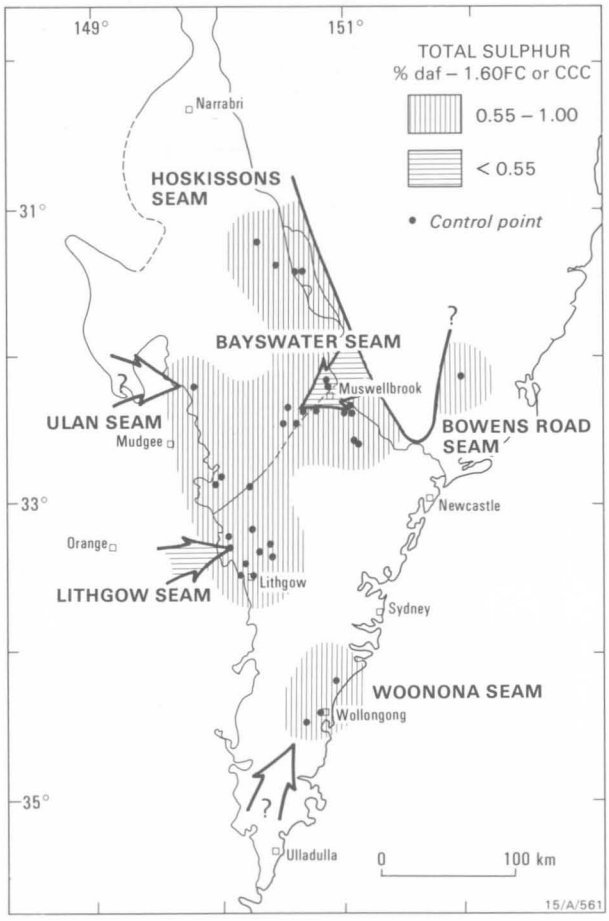


Fig. 24–26. Palaeogeography of lower part of upper coal measures, Bayswater seam horizon in the Gunnedah, Sydney and Gloucester Basins, based on total sulphur content of the Hoskissons, Bayswater, Ulan, Lithgow, Woonona and Bowens Road seams.

In almost all localities, the coals have a medium-sulphur content, with the main exception being a small area of low-sulphur coal near Muswellbrook. The coal probably formed on a flat, waterlogged coastal plain, which became emergent after a rapid withdrawal of the sea from the now-infilled area

formerly occupied by the Kulnura marine incursion. The medium-sulphur content suggests that sea water was kept out by a persistent fresh-water through-flow. The low-sulphur coal near Muswellbrook may be due to downslope drainage from a distal piedmont originating in the New England Fold Belt.

Top part of upper coal measures. The Rangal Coal Measures and Bandanna Formation of the Bowen Basin (Fig. 24–27) saw a persistence of the southeasterly palaeoslope which was evident in German Creek–Moranbah time. Fluvial low-sulphur coals in the northern and western parts of the basin give way to medium-sulphur coals of lower delta plains to the east and southeast. The low-sulphur values south of Emerald correspond to a region to which there are only occasional references in the literature to deltaic environments. Isolated high and medium values for sulphur on the Springsure Shelf and in the far north of the basin are anomalous, and their significance, if any, can only be determined by further work.

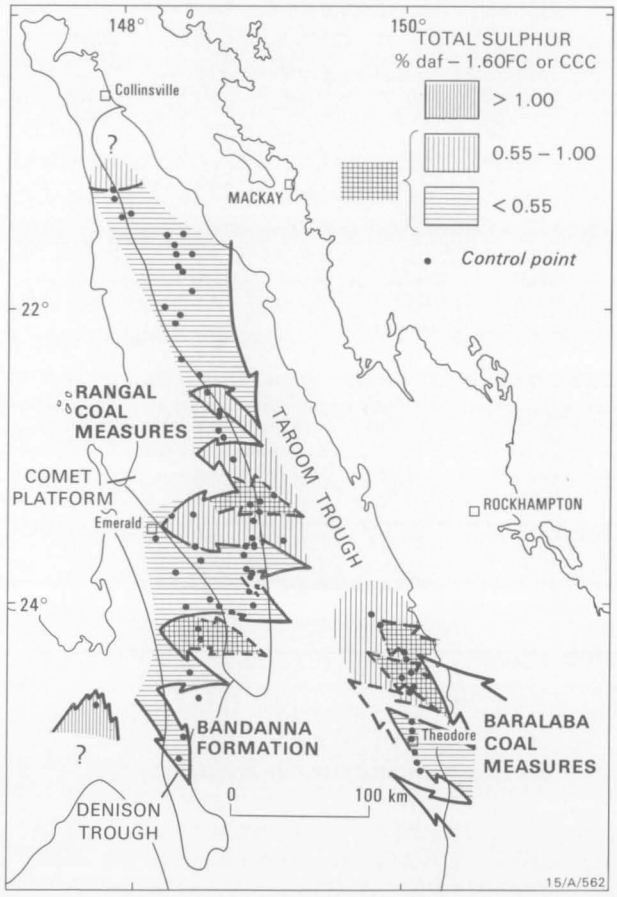


Fig. 24–27. Palaeogeography of the top part of upper coal measures, Bowen Basin, based on total sulphur content of seams in the Baralaba and Rangal Coal Measures and the Bandanna Formation.

The Baralaba Coal Measures in the eastern Bowen Basin accumulated in a very flat, extensive paludal setting, in which river channels migrated laterally in a distinctive way controlled by peat compaction (Mallett & others, 1980). The coal sulphur contents show a clear northerly trend from low to alternating low and medium values, indicating a palaeoslope in that direction. This agrees with the few, widely distributed palaeocurrent determinations obtained by Jensen (1975) for the southern portion of the exposed part of the Bowen Basin. A residual ponded facies in the central eastern part of the basin is thereby implied. It should be noted, however, that recent seismic exploration in the Baralaba area has revealed delta progradation towards the south beneath the coal measures. The conflicting evidence is as yet unresolved, but continued basin subsidence in this flat area may have reversed the palaeoslope causing ponding to the north.

To the west, Bandanna Formation sedimentation in the Galilee Basin was predominantly deltaic. Sulphur contents of coal along the eastern basin margin are low in the north and irregularly low and medium in the south. Figure 24–28 gives an interpretation. Streams probably drained westwards off the Anakie High and southwards from the Lolworth–Ravenswood Block (Hawkins, 1976) to form deltas in the basin. The low to medium sulphur values suggest that the deltas were building out into either a fresh-water body or a gulf of diluted sea water, like the Baltic Sea. Along the basin axis, progradation was to the south.

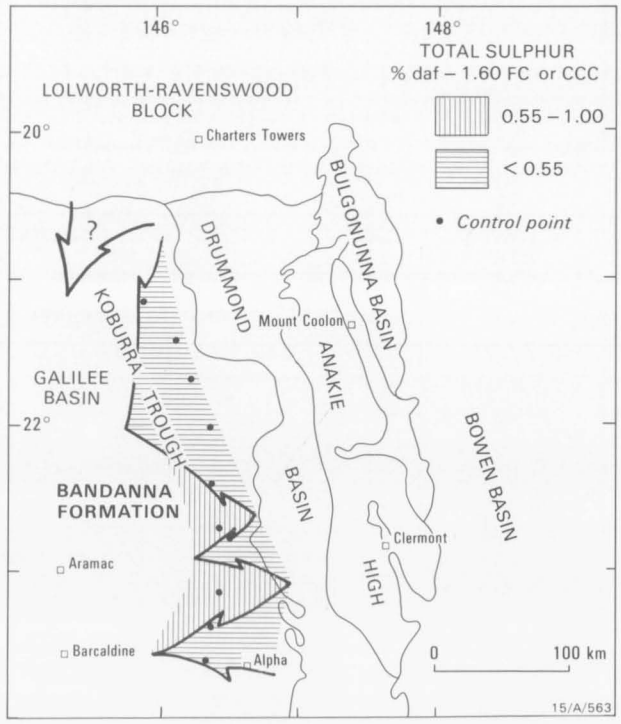


Fig. 24–28. Palaeogeography of the top part of upper coal measures, Galilee Basin, based on total sulphur content of seams in the Bandanna Formation.

In the Sydney and Gunnedah Basins, the rocks in the sequence comprise the upper half of the Newcastle Coal Measures and its equivalents in the Illawarra Coal Measures, Wollombi Coal Measures and the Black Jack Formation. The northern half of this region was dominated by proximal alluvial fans, with sources in highlands to the north and east. In the southern part of the region, a more distal fluvio-deltaic regime existed. Low-sulphur coals are confined to the margins of the Sydney Basin, and medium-sulphur coals are present in the basin centre (Fig. 24–29) suggesting that ponded brackish conditions persisted there longest. It is also possible that the medium-sulphur coals in the basin centre belong to a lower level in the coal measures, because of erosional removal of overlying coals at the end of the Permian. Lack of stratigraphic control in the basin centre does not at present allow testing of this explanation. However, Herbert (1980) demonstrated progradation of this interval across the Sydney Basin from north to south, and Diessel & others (1967) found that an erosive southerly flowing river system was established just above the top of the Bulli Coal. The arrow shown in the southern Sydney Basin in Fig. 24–29 is conjectural, because all the coals there are low in sulphur.

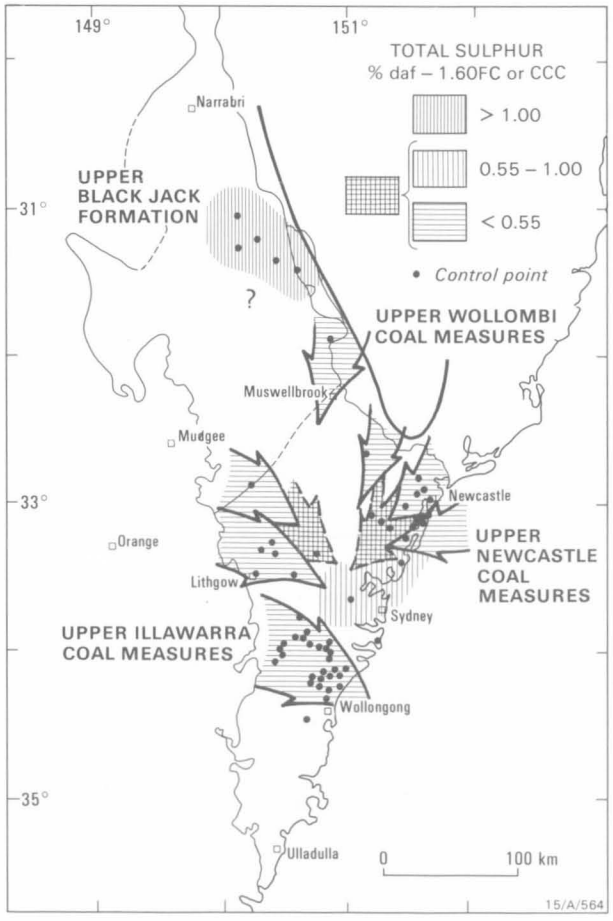


Fig. 24–29. Palaeogeography of the top part of upper coal measures, Gunnedah and Sydney Basins, based on total sulphur content of seams in the Wollombi, and upper Newcastle and Illawarra Coal Measures.

The high-sulphur coal in the Gunnedah Basin is problematic. The analyses are from the highest seam in several bores of the NSW Department of Mineral Resources. Nevertheless, the seams may belong to the lower part of the upper coal measures, if the overlying Digby Formation has replaced the higher coal seams. It is also conceivable that sulphate may have infiltrated downwards from the marine portion of the Napperby Formation, which overlies the Digby Formation.

Conclusions

Microlithotypes

The major controls on the microlithotype composition of Australian Permian coals (i.e., the degree of mixing of vitrinite and inertinite at the 50 μm band width level) were the make-up of the peat-forming flora (low diversity of pteridosperm assemblage) and the tectonic setting of the basins. Coals from any particular area and age have a characteristic degree of microscopic banding for the whole range of vitrinite content.

Early Permian coals are more finely banded on average than Late Permian coals, probably reflecting climatically controlled compositional changes in the peat-forming flora. Fine to very finely banded coals originated in the intracratonic basins both in the Early and Late Permian, denoting slow subsidence rates and low biological productivity to low nutrient supply. The marginal basins have mainly medium-banded coals in the trough sequences and finely banded coals in the shelf deposits.

Macerals

Australian Permian coals show distinctive petrographic groupings which may be related to their tectonic and depositional settings. The intracratonic basins are characterised by generally fluvio-lacustrine systems, subject to large variations in water table levels, particularly in the flood plain areas. Their coals have medium vitrinite contents in areas with more continuously high water tables (channel zone) and have high inertinite contents in the adjacent flood plains. The inertinite of the coals is mainly inertodetrinite, attesting to substantial transport, and a generally shrubby peat-forming flora which resulted from poorer edaphic conditions within the fluvio-lacustrine systems. "Band macrinite" derived from oxidised, partly gelified, woody material is a prominent accessory.

The marginal basins are characterised by fluvio-deltaic complexes subject to consistently high water-table levels in the deltas, with greater fluctuation in the adjoining fluvial areas. Coals formed within the deltas are generally high in vitrinite, with a predominance of semifusinite in the inertinites, suggesting a nutrient-rich edaphic milieu, resulting in woody peats. Coals of the adjacent fluvial systems show a wide range of vitrinite content, with a high proportion of semifusinite in the inertinites, implying in situ subaerial oxidation of woody peat facies.

Within the marginal basins, several possibly lagoonal coals are recognised. They are located at the base of or within deltaic sequences, are usually low in vitrinite and high in inherent mineral matter, and have a predominance of inertodetrinite in the inertinite. The lagoonal coals may be distinguished from similar low-vitrinite, high-inertodetrinite coals in the intracratonic basins mainly on the basis of their higher inherent mineral and sulphur contents, and general geological setting.

Phosphorus

Phosphorus content shows a distinctive relationship with depositional environment throughout the Permian. In the small intracratonic basins, which were characterised by fluvial environments in both the Early and Late Permian, only low or medium-phosphorus coals formed. No analytical data are available for the large intracratonic basins.

The marginal basins have coals with a wide range of phosphorus contents. Lower delta plain facies and areas of interpreted marine influence contain mainly high-phosphorus coals of both Early and Late Permian age, whereas overlying upper delta plain facies have mainly low-phosphorus coals.

Fluvial facies, predominating at the top of the Late Permian, are characterised by high-phosphorus coals, which give way to laterally lower-phosphorus coals in the basin centres. Braided-fluvial facies, however, contain only low-phosphorus coals throughout the Permian.

Ash

Ash content. The relationship between ash content and sedimentary environment is not clear because secondary minerals, which may be of volcanic origin, are present in varying amounts throughout the coal measures.

Ash composition. The relationship of the $Si0_2/Al_3O_3$ ratio to depositional environment is often obscured, because of varying amounts of probably secondary volcanic-derived silica. However, if high-SiO_2 samples are excluded from consideration, some generalisations are possible.

The small intracratonic basins contain coals with low to medium SiO_2/Al_20_3 ratios deposited in fluvial conditions. In the marginal basins, the more marine-influenced and lower delta plain facies have low, and in one case very low, $Si0_2/Al_20_3$ ratios. The overlying upper delta plain, fluvial and braided-fluvial facies have coals with variable $Si0_2/Al_20_3$ ratios in the ash, and the distribution of the $Si0_2/Al_20_3$ ratios may be geographically, not geologically, controlled.

Sulphur

Sulphur content of the Permian coals shows a predictable relationship with most depositional environments throughout the Permian. The form of sulphur combination is, however, more unpredictable.

Lower delta plain facies have medium and high-sulphur coals, the sulphur increasing in the direction of marine influence. High sulphur content in the middle coal measures is often indicative of increased sulphate associated with the mid-Permian marine transgression. Upper delta plain and fluvial coals are characterised by mainly low amounts of sulphur. Many sequences show varying sulphur contents in the transition from deltaic to fluvial deposits, probably reflecting alternating facies.

Fluvial sequences on the basin margins, with low-sulphur seams at the top of the Late Permian, grade laterally into beds with medium-sulphur seams in the basin centres, where terrestrial sulphate concentration may have taken place.

Braided-fluvial facies are typified by low-sulphur seams in both the Early and Late Permian, probably reflecting access to only terrestrial sulphate sources, as well as a low residence time of the sulphate in an area of contributive drainage.

Medium and low-sulphur coals show a dependence of total sulphur content on vitrinite content, which accounts for an increase of about 0.25% in the medium-sulphur coals, and 0.10% in the low-sulphur coals over the range of 0–100% vitrinite. This relationship suggests that for a given sulphate concentration, the vitrinite precursors took up more sulphur than the inertinite precursors.

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CHAPTER 25

Coal-Rank Trends of Eastern Australia in Permian Coal Basins

by
M.F. Middleton

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Introduction

This chapter discusses existing coal rank in the CSIRO data bank, and published and newly collected information. The study shows coal rank trends on a regional scale beyond that of a specific colliery or mining region, and proposes geological causes for these trends. The effect of igneous bodies on coal rank is presented in Chapter 29, which can aid the understanding of how and where coal is altered by intrusions. Moreover, kinetic models of coalification demonstrate that a predictive approach of the coalification process is presently available. Prediction of coalification under a given set of geological conditions must eventually be an invaluable asset to geological coal exploration. Coal-rank trends may also be used to predict outburst-prone areas, because in the Sydney and Bowen Basins any coals with <30% volatile matter (dry ash free) at over 200 m depth in the subsurface could be outburst prone (Hargraves, 1983).

Among the aims of the present coal investigation, a considerable proportion of effort was devoted to the Sydney and Bowen Basins. However, the other eastern Permian coal basins (or coalfields) studied were the Gunnedah, Ashford, and Gloucester Basins. The Calen Coal Measures, the Blair Athol Basin, and the Wolfang Basin are all included as part of the Bowen Basin. Plate 23 (at a scale of 1:2 500 000) shows the locations of the basins. The series of 1:2 500 000 maps accompanying this report are the culmination of the project: coal-rank trends on several time surfaces and an interpretative map of coal-rank trends for the eastern Australian coal basins are provided. Little rank data exists for the Permian coals of Tasmania; in any case time and financial restrictions precluded a study of the rank of these coals.

Coal undergoes changes (i.e., diagenesis and low-grade metamorphism) from peat to anthracite with an increase in burial and heat plus pressure. This change is known as coalification; the increase of coal rank with increasing temperature was defined as long ago as 1883 by Von Gumbel. Coal rank is the measure of coalification or organic metamorphism. A number of indices are used to indicate this rank: the more popular of these indices are volatile matter, carbon content, calorific value and, more recently, the reflectance of vitrinite in oil. Volatile matter is particularly useful as a measure of rank in brown coals; indeed vitrinite reflectance is rapidly becoming the most popular index of coal rank. The technique of measuring this reflectance, originally reported by Hoffman & Jenkner (1932), is well documented in the literature (Hacquebard & Donaldson, 1970; Stach 1975). Essentially, the vitrinite, e.g., reflectivity, is measured with a photomultiplier tube at a wavelength of 546 nm and compared with the reflectivity from a standard of known reflectance; the objective of the microscope is immersed in oil of refractive index of 1.518. Figure 25–1 shows the correlation of a number of common coal-rank indices (Stach, 1975).

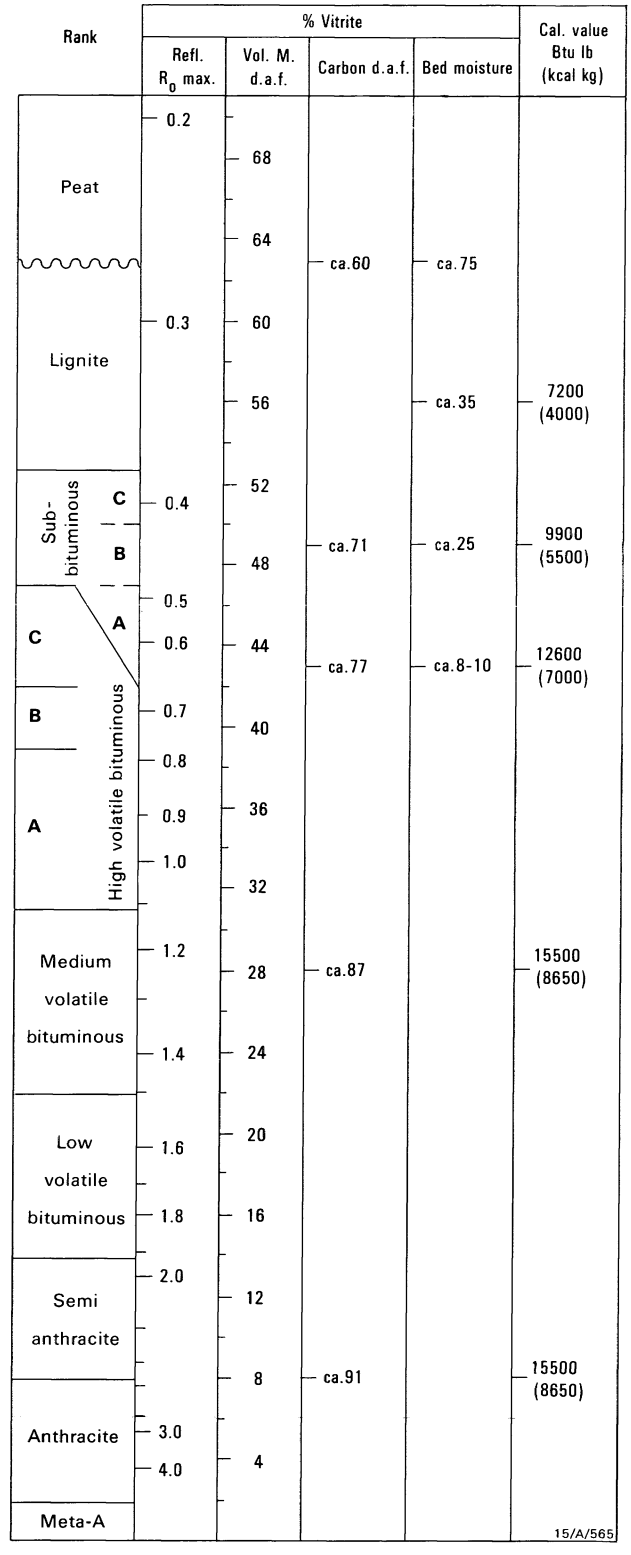

Fig. 25–1. Rank correlations from Stach (1975).

The aim here is to present coal-rank data from eastern Australian Permian basins in the form of (a) contour maps of vitrinite reflectance on various time horizons; (b) vitrinite reflectance versus depth data for a number of key boreholes or exploration wells in the major coal basins; and (c) interpretation of the rank-trends on a regional basis. (d) Studies of the coalification process are also reported. All reflectance data measured specifically for the Permian Coals project and information used in the regional rank maps are tabulated in the CSIRO Data Base (microfiches 7 and 8).

Regional Coal Rank Variation

Sydney Basin

There have been many studies of coal rank variation in the Sydney Basin (e.g., Cook & Wilson, 1969; Shibaoka & others, 1973; Diessel, 1975; Marchioni, 1980). Only Diessel (1975) covers rank variation across the whole of the Sydney Basin. The present report, however, presents only Ro-depth factors at ten localities. A large number of vitrinite reflectance measurements have been made on samples from the coal mining districts around the margins of the basin. However, a small number of bores and petroleum exploration wells penetrated deeper parts of the basin; vitrinite reflectance analyses from nine of these localities are included here. Figures 25–2a and 2b show the vitrinite reflectance versus depth for the nine deep drill sites with linear regression lines drawn through the log-vitrinite reflectance versus depth. These data form the basis of a discussion by Middleton & Schmidt (1981) of the palaeothermometry of the Sydney Basin based on coal rank and magnetization. Control points, for which vitrinite reflectance data exist, are given in Plate 23. These points are numbered to coordinate with the locations and information in the CSIRO Data Base (microfiches 7 and 8).

Coal-rank variation in the Sydney Basin is determined on three time planes using the set of control points in Plate 23: (a) present-day surface (present-day time plane), Fig. 25–3; (b) top of the Illawarra and Newcastle Coal Measures (top of the Permian coal measures' time plane), Fig. 25–4; and (c) Greta Coal Measures (Artinskian time plane), Fig. 25–5.

The stratigraphy of the Sydney Basin in Herbert (1980) shows the Illawarra Coal Measures, the Newcastle Coal Measures, and the Wollombi Coal Measures to be time-equivalents in the Upper Permian Tatarian Stage. At a number of localities, the present-day time plane coincides with the Upper and Lower Permian time planes. The Upper and Lower Permian outcrop is shown in Plate 23, respectively. Where no measurements have been made at the present-day surface and data from deeper parts are of sufficient quality, the surface reflectance is determined by extrapolation to the surface (see Figs 25–2a and 2b).

A general trend of decreasing coal rank towards the west is evident in each time plane. This trend strongly suggests either a strong heat source or deeper burial along the eastern margin of the Sydney Basin. The high coal rank at the surface between Sydney and Wollongong suggests temperatures of the surface rocks to have been once in the order of 150 to 200°C. An interpretation of these coal rank trends is made later in this chapter.

Gunnedah Basin

The Gunnedah Basin is a north–south 150 km-wide strip of Permian and Triassic sediments joining the Sydney Basin to the Bowen Basins. The Narrabri High forms the northern margin and the Mt Coricudgy Anticline the southern margin (see Plate 23). The stratigraphy and structure of the basin has been described by Russell (1981) and coal resources by Britten & Hanlon (1975), who call the basin the Northwestern Coalfield of the Sydney Basin. Figures 25–6a and 6b show plots of vitrinite reflectance versus depth for 12 deep bores or petroleum exploration wells in the Gunnedah Basin and southern Bowen Basin (that part of the Bowen Basin within New South Wales); the locations are given in Plate 23. These measurements were made for the present report to complement the existing sparse data from the Gunnedah and southern part of the Bowen Basin. Some of the data have been published in a preliminary report by Russell & Middleton (1981).

Insufficient data exists to produce reliable isoreflectance maps. However, Fig. 25–7 shows the available information for a north–south cross-section through the Gunnedah Basin. The coal has a vitrinite reflectance of less than 1%, and as such is high-volatile bituminous coal (see Fig. 25–1). Coal of anthracite rank is encountered near igneous activity and is present in the deep bore Wondobah DDH-1. The anthracite, when associated with an igneous dyke or sill, does not generally extend beyond a zone equal to the dyke or sill thickness on either side of the igneous body. The effects of igneous intrusions on coal rank are fully reported in Chapter 29.

As the coal rank is essentially low and commonly less than 0.6% at depths of several hundred metres, the palaeotemperatures of Permian rocks in the Gunnedah Basin have been considerably lower than those of the Sydney Basin.

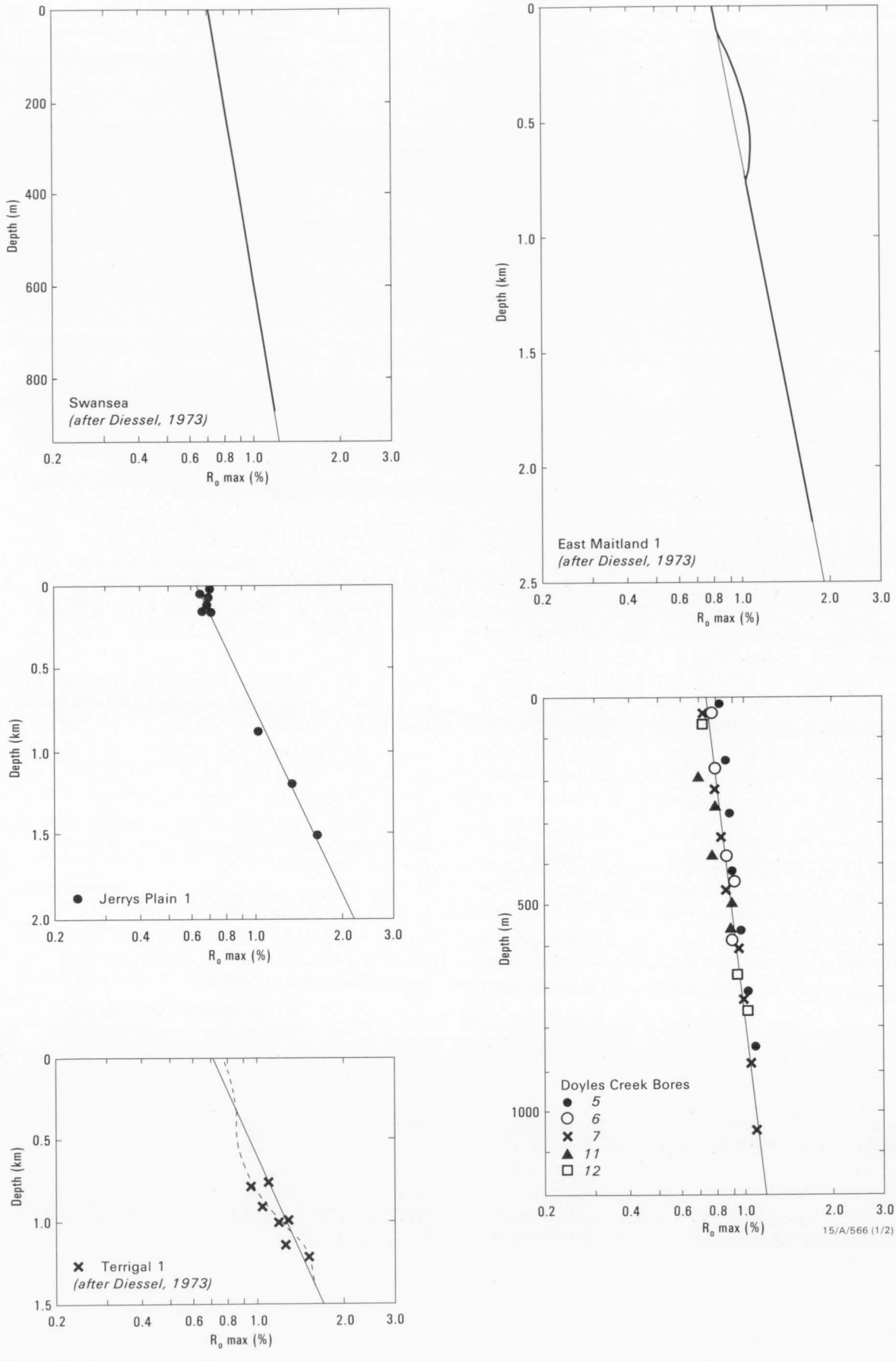

Fig. 25–2a. Vitrinite reflectance versus depth for five deep bores in the Sydney Basin.

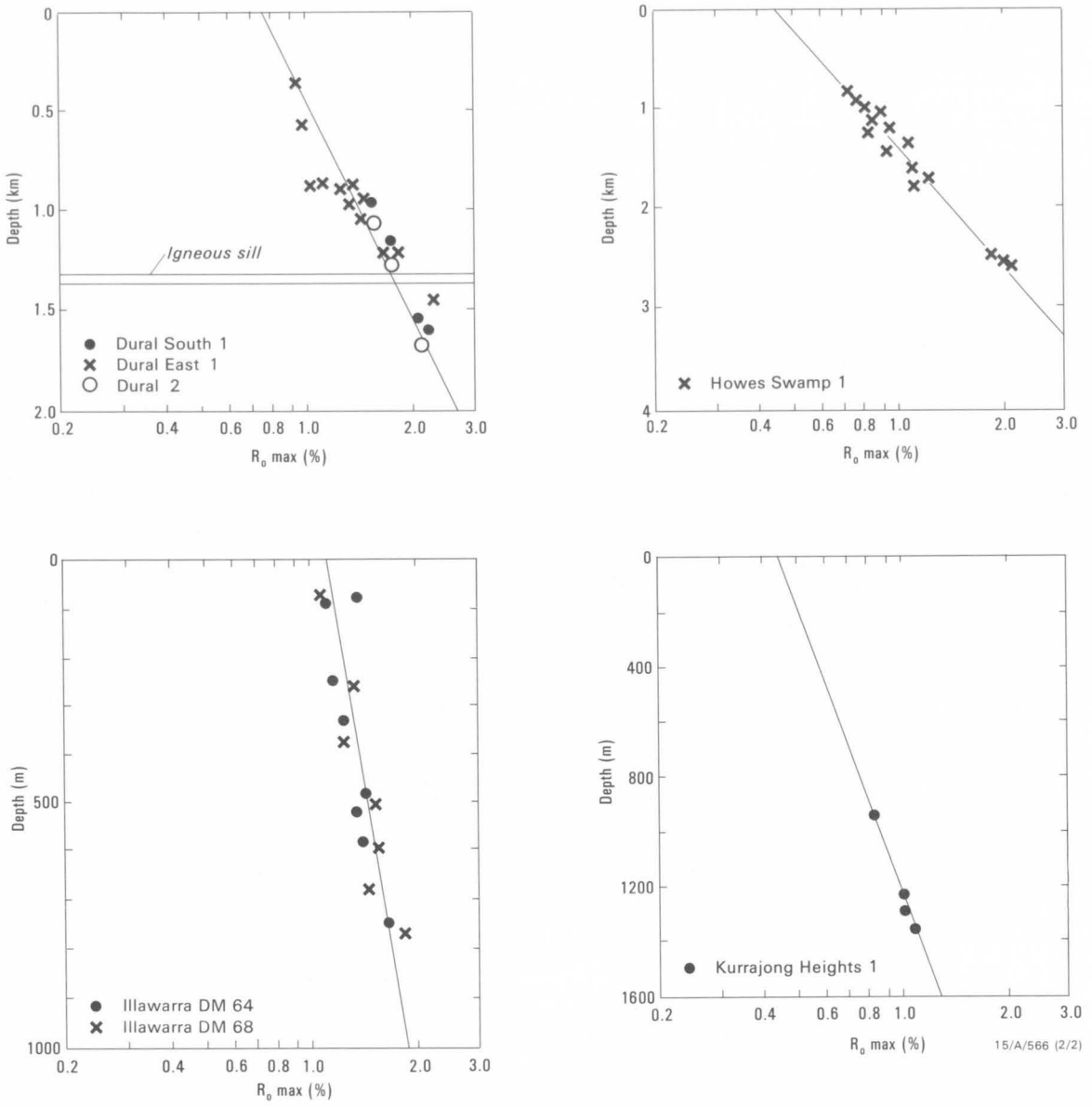

Fig. 25–2b. Vitrinite reflectance versus depth for four deep bores in the Sydney Basin.

Bowen Basin

The coal geology of the Bowen Basin is known from many years of coal exploration, beginning before the present century. King (1975) has excellently reviewed this exploration history of Australia; he reports the earliest drilling by the Queensland Government to be as early as 1885–86. The Bowen Basin is divided into several tectonic provinces (Fig. 25–8), of which best-explored are the Comet Platform and Collinsville shelf, because of the presence of mineable coal. Coal occurs in the Mimosa Syncline and Denison Trough, but is too deep to be currently exploited. Anthracite deposits have been mined in the Dawson Folded Zone, with the Yarrabee anthracite Mine at present in operation.

The regional rank of the basin has been examined by Beeston (1981); these data have been published as preliminary maps by Staines & Koppe (1979). The Dawson Folded Zone, previously known as the Dawson Tectonic Zone, has received attention from a number of researchers (Hawthorne, 1965; Kempton, 1969, 1971; Shibaoka & Bennett, 1976). The high ranks in this zone appear to be due to an uplift of several kilometres and subsequent erosion, which exposed semi-anthracitic coal. These semi-anthracites would have formed at palaeotemperatures in excess of 200°C. A fuller discussion of this zone is given later in this chapter.

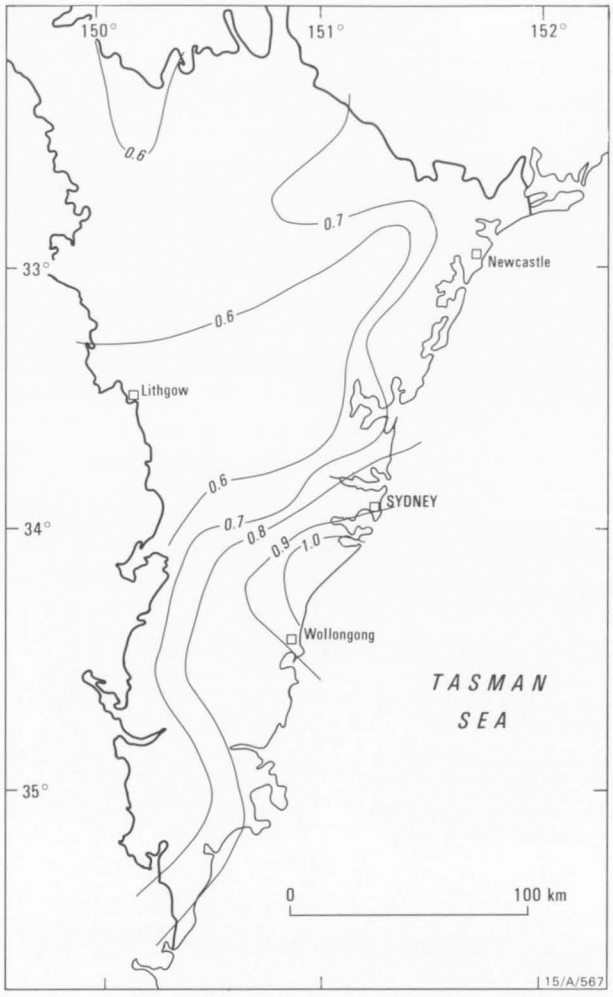

Fig. 25–3. Isoreflectance map for the surface rocks of the Sydney Basin.

A large number of relectivity measurements on specimens from the Bowen Basin coal mining regions have been made by A.J.R. Bennett of the CSIRO. Other data have been published or are available in Geological Survey of Queensland unpublished Records. Figures 25–9 and 10 are isoreflectance maps (from Beeston & others, 1979) of the Rangal Coal Measures and equivalents, and the older German Creek Formation and Moranbah Coal Measures, respectively. According to J.W. Besston, the available large amount of reflectivity data for the Bowen Basin, defines the rank trends in greater detail than the just-cited maps.

The four coal horizons in the Bowen Basin are (Hawthorne, 1974): Group 4–The Rangal Coal Measures and equivalents; Group 3–Moranbah Coal Measures and German Creek Formation; Group 2–Collinsville Coal Measures and equivalents, and Group 1–Reids Dome Beds.

Figures 25–9 and 10 show isoreflectance maps of Groups 4 and 3, and Fig. 25–10, the isoreflectance maps of Besston in Staines & Koppe (1979). Perhaps more meaningful tectonically, as well as economically, is Fig. 25–11 with its isoreflectance map of the surface (and near-surface) coal measures and Permian outcrop in the southern part of the exposed Bowen Basin.

The reflectivity trends closely follow the tectonic provinces with high rank coals (semi-anthracites and anthracites) in the Dawson Folded Zone and bituminous coals on the Comet Ridge and Collinsville Shelf. The Collinsville Coal Measures have been extensively intruded (Staines & Koppe, 1979). Localized higher-rank zones are present with these intrusions. Minor intrusions occur throughout the basin. At Blackwater, for example, where a basalt sill has coked several metres of coal above and below the level of intrusion, and in Wodehouse N.S.1 in the Nebo Synclinorium (see Fig. 25–8), reported by Beeston (1978), vitrinite reflectances in excess of 5% occur near intruded sills.

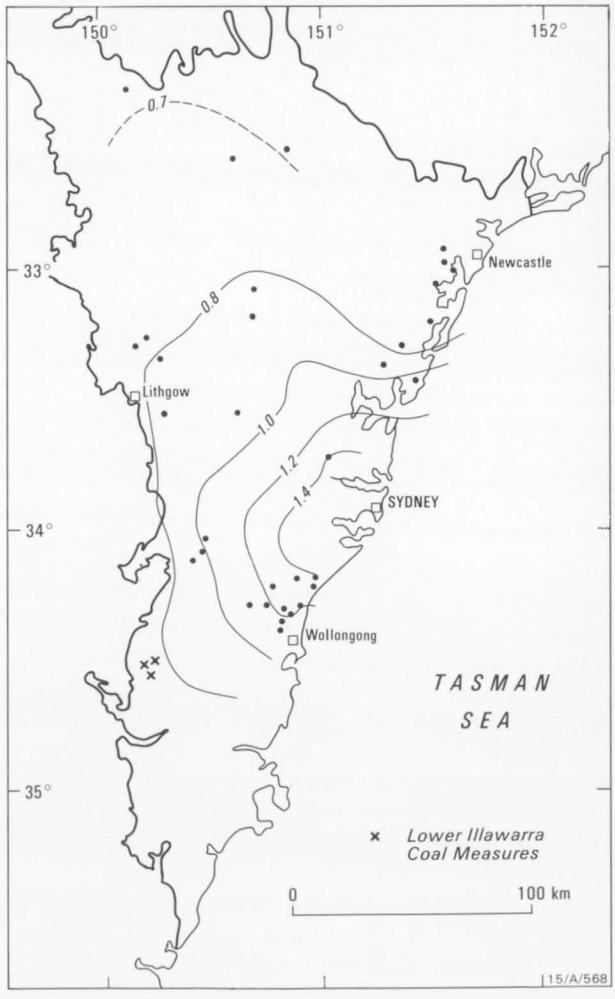

Fig. 25–4. Isoreflectance map for the uppermost Permian coal measures in the Sydney Basin.

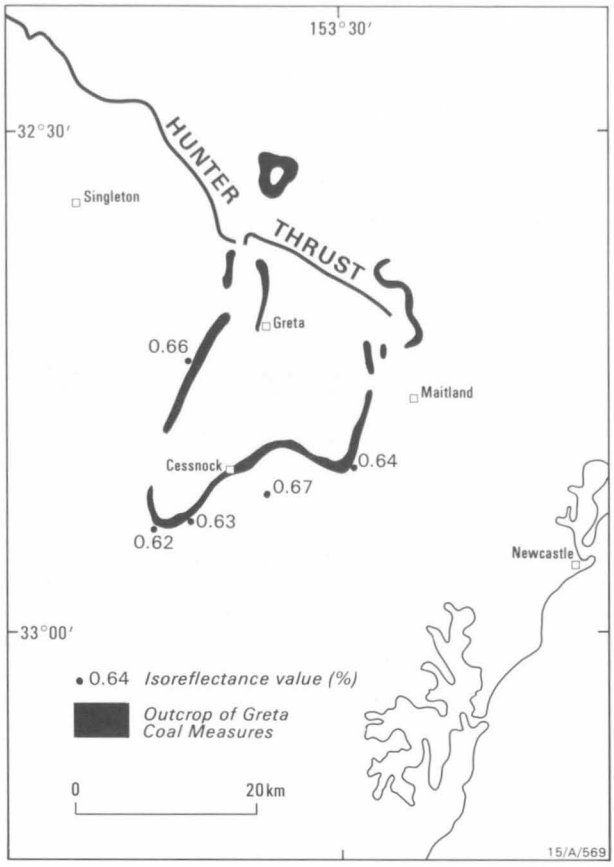

Fig. 25–5. Isoreflectance map for the Greta Coal Measures of the Sydney Basin.

Galilee Basin

The Galilee Basin is a westward extension of the Bowen Basin (Plate 23), and may have been connected to the Cooper Basin for limited periods during the Permo-Triassic. The Permian coal-bearing units are the Lower Permian Aramac Coal Measures and the Upper Permian Bandanna Formation correlative.

Vitrinite reflectance data have been reported by Beeston (1977), Hawkins & Balfe (1980), and Jackson & others (1981). Figure 25–12 shows Permian outcrop and vitrinite reflectance data. The coal in the basin is sub-bituminous to bituminous. The higher ranks appear to be due to burial metamorphic changes only.

The Galilee Basin has coal ranks similar to the Gunnedah Basin with sub-bituminous coals near the surface and high volatile bituminous coals at depth. Both basins probably experienced similar palaeotemperatures and coalification, although the Permian sediments in the Galilee Basin have been buried less deeply than those of the Gunnedah Basin. Exploration of the Galilee Basin is presently (1984) continuing and coalification trends may be more clearly defined as more data are made available. However, the basin essentially contains low-rank coals and present trends indicate little possibility of coking coals.

Cooper Basin

The Cooper Basin, the most westerly one included in the present study (Plate 23), has extensive Permian coals. The Lower Permian Patchawarra Formation has coal seams up to 24 m thick (Battersby, 1976). Vitrinite reflectance data have been published by Shibaoka & others (1973), Beeston (1975), Shibaoka & Bennett (1977), Kantsler & others (1978a), and Kantsler & others (1978b).

Sufficient data are available from both publications and the CSIRO data-bank to draw a preliminary isoreflectance map of the Upper Permian Toolachee Formation (Fig. 25–13). Middleton (1979) has suggested that the high reflectance value near Moomba are related to high heat flow owing to uranium and thorium in the underlying granitic basement, which are greater than three times the continental average; greater uranium and thorium concentrations will cause greater radiogenic heat, and, therefore, increased heat flow.

Permian coal in the Cooper Basin ranges from high volatile bituminous to anthracite rank. Coalification is essentially a burial phenomenon under differing geothermal gradients. The reflectance versus depth curves for the Tindilpie No.1 well and the Burley No.1 well (data from Kantsler & others, 1978b) outline the lower and upper limits of coalification, respectively (Fig. 25–14). All other published data fall within these limits.

A.J.R. Bennett (personal communication, 1980) has suggested that a discontinuity in the reflectance versus depth curves for the Cooper Basin reflect a widespread erosional unconformity between Triassic and Jurassic sediments. Deep burial, greater than 3 km, and high heat flow, 2.6μcal cm^{-2} s^{-1} (109 mW m^{-2}), appear to be critical factors that controlled coalification in the Cooper Basin.

The discontinuity could be well explained by the observation of Middleton (1978) that some 200 m or so of Triassic sediment has been lost owing to a Late Triassic–Jurassic heating event. This caused a discontinuity in the recorded vitrinite reflectance versus depth, as well as enhanced the rank discrepancy by burial during Jurassic times with an elevated geothermal gradient. Coalification of Jurassic sediments would not be great during Jurassic times as burial is small, and coalification after Jurassic times is of a much diminished geothermal gradient (Middleton, 1978).

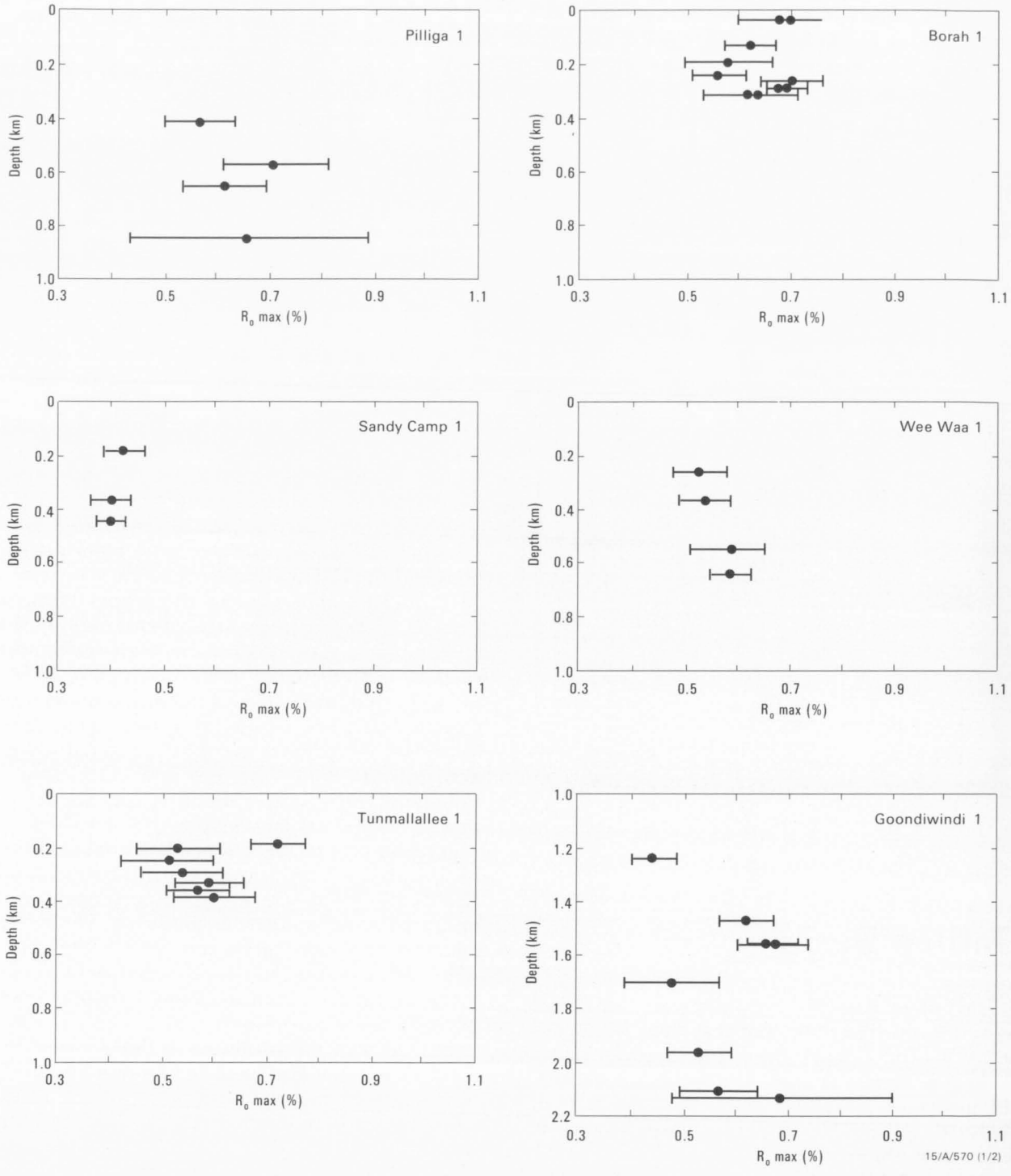

Fig. 25–6a. Deep bores in the Gunnedah and southern Bowen Basins: Virtrinite reflectance versus depth.

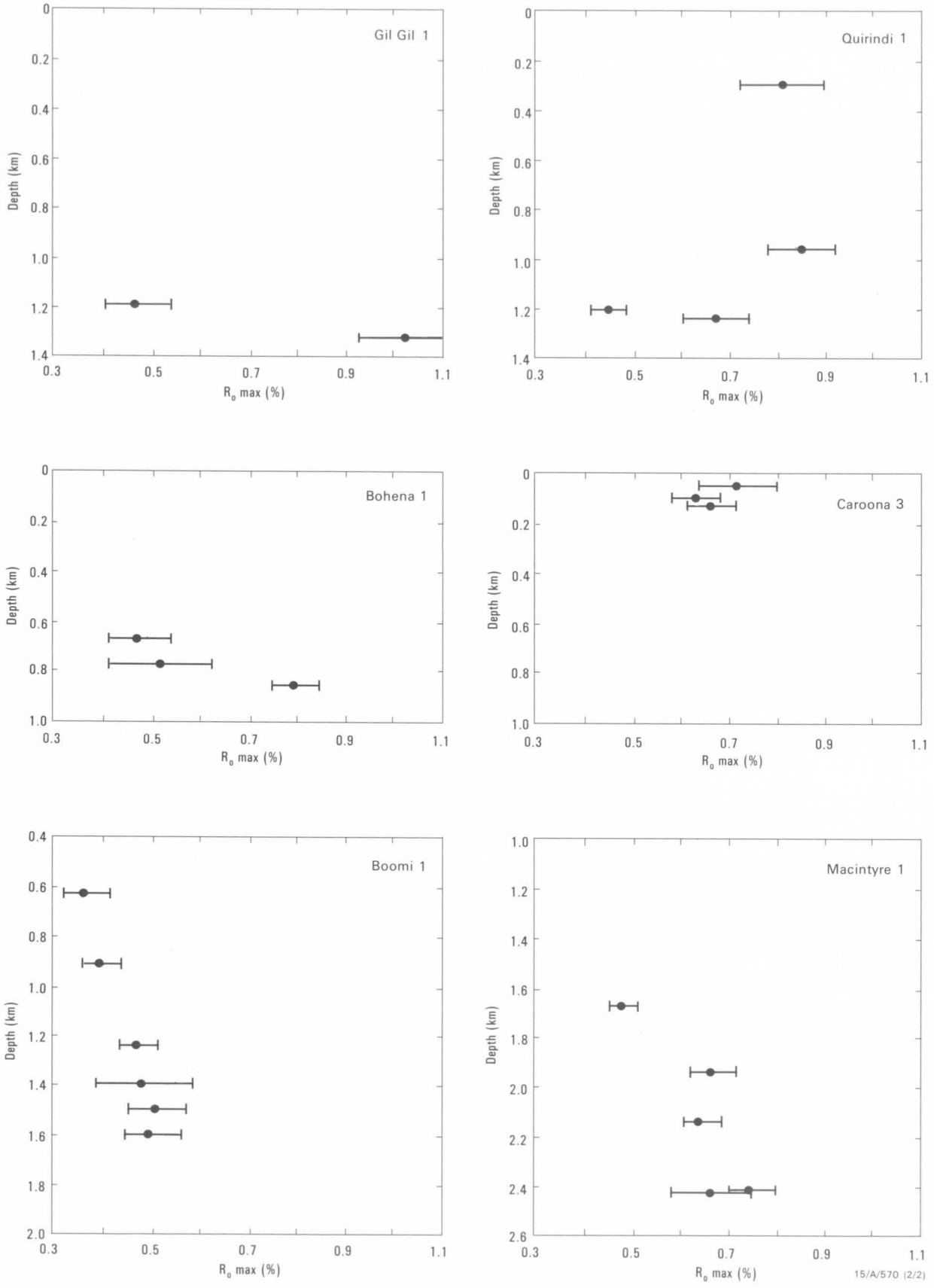

Fig. 25–6b. Deep bores in the Gunnedah and southern Bowen Basins: Virtrinite reflectance versus depth (cont.).

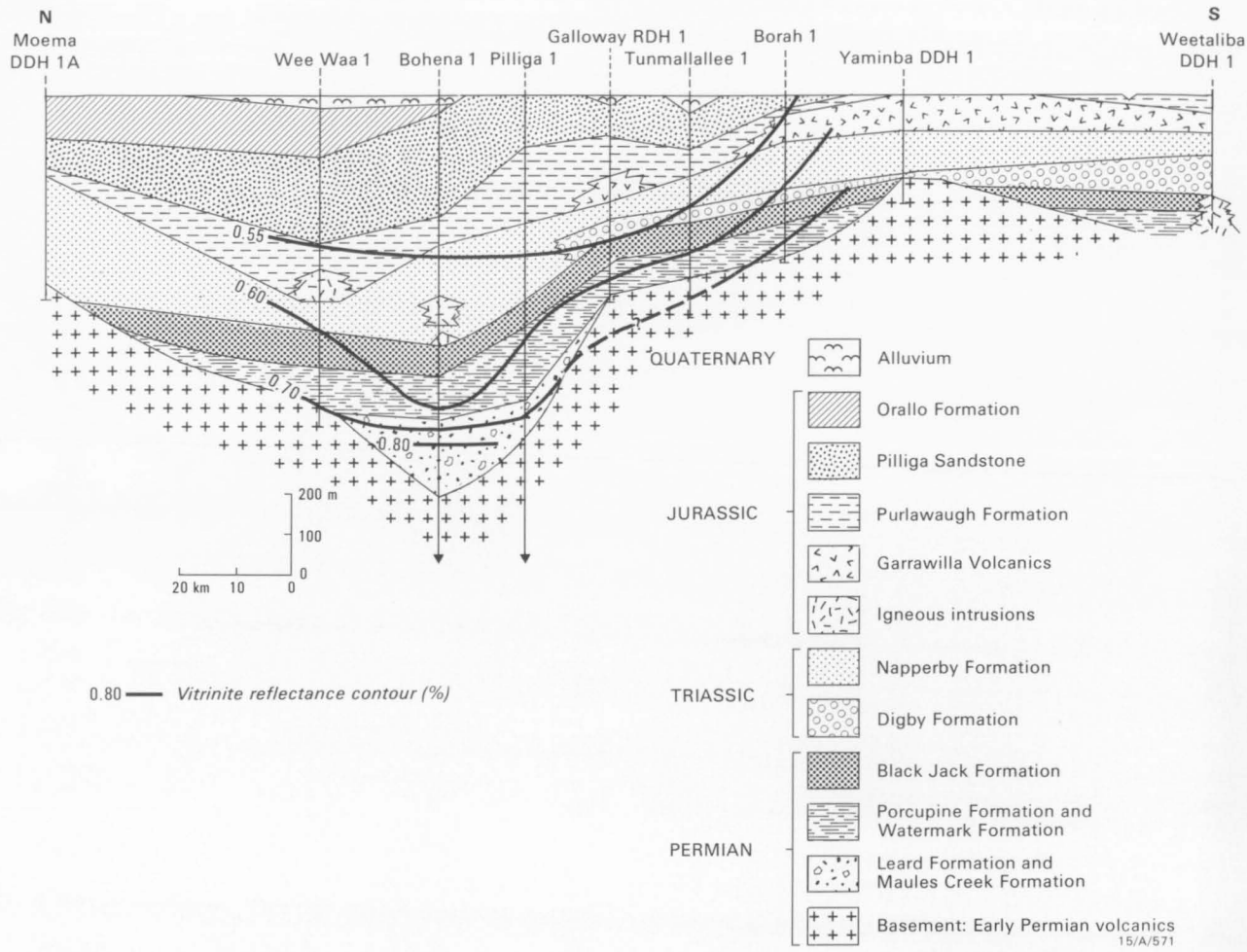

Fig. 25–7. North-south cross-section through the deeper part of the Gunnedah Basin with reflectance values contoured. The location of the section GG' is shown in Plate 25–1.

Other Basins

Gloucester Basin

The coal geology of the Gloucester Basin (see Plate 23) is described by George (1975). The basin essentially has high volatile bituminous coals. Only one value of vitrinite reflectance is currently available in the CSIRO data-bank for the Gloucester Basin, which is 0.90%. George (1975) reports volatile matter between 30.8% and 41.7% (dmmf).

Ashford Basin

The Ashford Basin has a narrow strip of Permian coal measures to the east of the buried part of the Bowen Basin in northern New South Wales; the coal geology has been described by Britten (1975). He quotes vitrinite reflectances of 1.02% and 1.06%, respectively, for all vitrinite and vitrinite "A" of the Ashford coals. A.J.R. Bennett (personal communication, 1980) has measured a vitrinite reflectance of 1.11% for coal from open-cut workings in the coalfield. The coal is high volatile bituminous rank.

Oaklands Basin

The Oaklands Basin is located in southern New South Wales (Plate 23); Driver (1975) has described its coal geology. Vitrinite reflectance of the Oaklands coal is 0.36%, which indicates sub-bituminous coal. The coal can be utilized in power generation and conversion to liquid hydrocarbons.

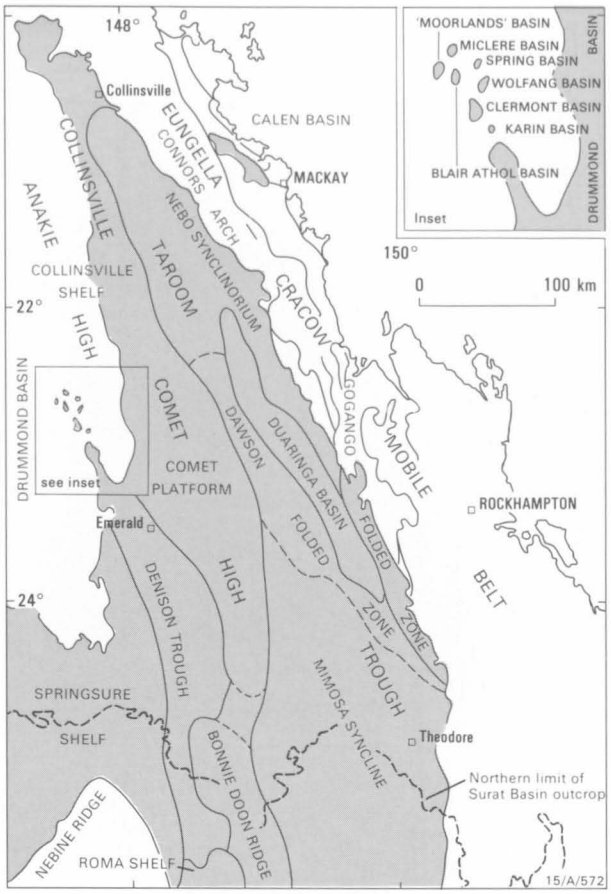

Fig. 25–8. Tectonic provinces of the exposed Bowen Basin.

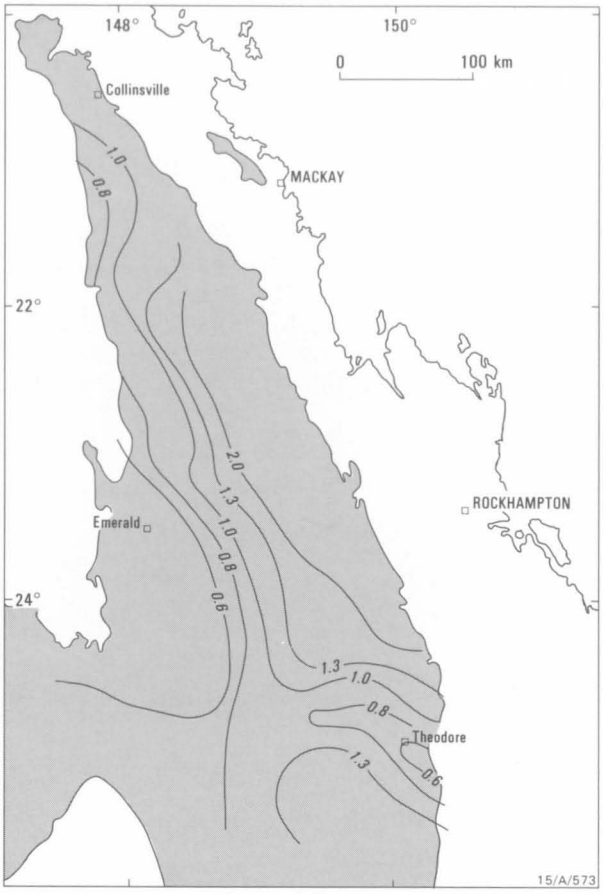

Fig. 25–9. Isoreflectance map of the uppermost Permian coal measures (Rangal Coal Measures) in the Bowen Basin.

The Coalification Process

Coalification consists of all processes which converts peat through a series of physiochemical changes into anthracite (Von Gumbel, 1883). Hilt's law of increasing coal rank with depth of burial has been substantiated by Teichmüller & Teichmüller (1968), who have given a full description of coal rank characteristics.

Karweil (1956) published a quantitative model of the coalification process, relating coal rank to temperature and time. Lopatin (1971) observed an important empirical relation, namely that the reaction rate during coalification doubles for every 10°C temperature increase. Recent coalification models have been based on Lopatin's observation. Lopatin & Bostick (1974) and Royden & others (1980) have proposed coalification models based on correlations of a thermal maturation parameter C to vitrinite reflectance in oil R. Lopatin & Bostick (1974) assume a correlation of:

$$R_o = -5.0321 + 0.5650\,C \qquad (25\text{–}1)$$

Royden & others (1980) assume a correlation of:

$$\log(R_o) = -0.9930 + 0.0782\,C \qquad (25\text{–}2)$$

The thermal maturation parameter C is related to temperature T(t) as a function of time t by the Lopatin empirical observation:

$$C = \ln \int_{o}^{t_1} 2^{T(t)/10} dt \qquad (25\text{–}3)$$

where t is the time of coalification. Other coalification models have been proposed by Hood & others (1975), Shibaoka & Bennett (1977), Kantsler & others (1978a), and Falvey & Middleton (1981). The Shibaoka & Bennett (1977) model used a correlation of the form of (25–2), but with slightly different numerical constants. The Falvey & Middleton (1981) model is a similar one to that of Royden & others (1980).

Combination of equations (25–2) and (25–3) gives:

$$(Ro)^a = A \int_o^{t_1} \exp[bT(t)]\,dt, \qquad (25–4)$$

where a = 5.5, b = 0.069 and A = 2.8×10^{-6}, and time t is in Ma. Falvey & Middleton (1981), Middleton (1981), Middleton & Ledsam (1981), and Middleton & Schmidt (1981) have used equation (25–4) in conjunction with the depositional and thermal history of a sedimentary basin to model vitrinite reflectance variation with time. Equation (25–4) can be combined with a geohistory diagram (Van Hinte, 1978), which has been previously called an oscillogram or Bubnoff plot, to produce the diagram in Fig. 25–15. Figure 25–15a shows a geohistory–coalification plot of Boomi-1 in the southern Bowen Basin. This plot demonstrates how coalification (in terms of vitrinite reflectance) develops through time. Also given is the present-day match of theoretical (calculated from equation 25–4) and observed vitrinite reflectance, and the assumed suface heat-flow history. The heat flow at Boomi-1 is assumed constant for the past 220 Ma.

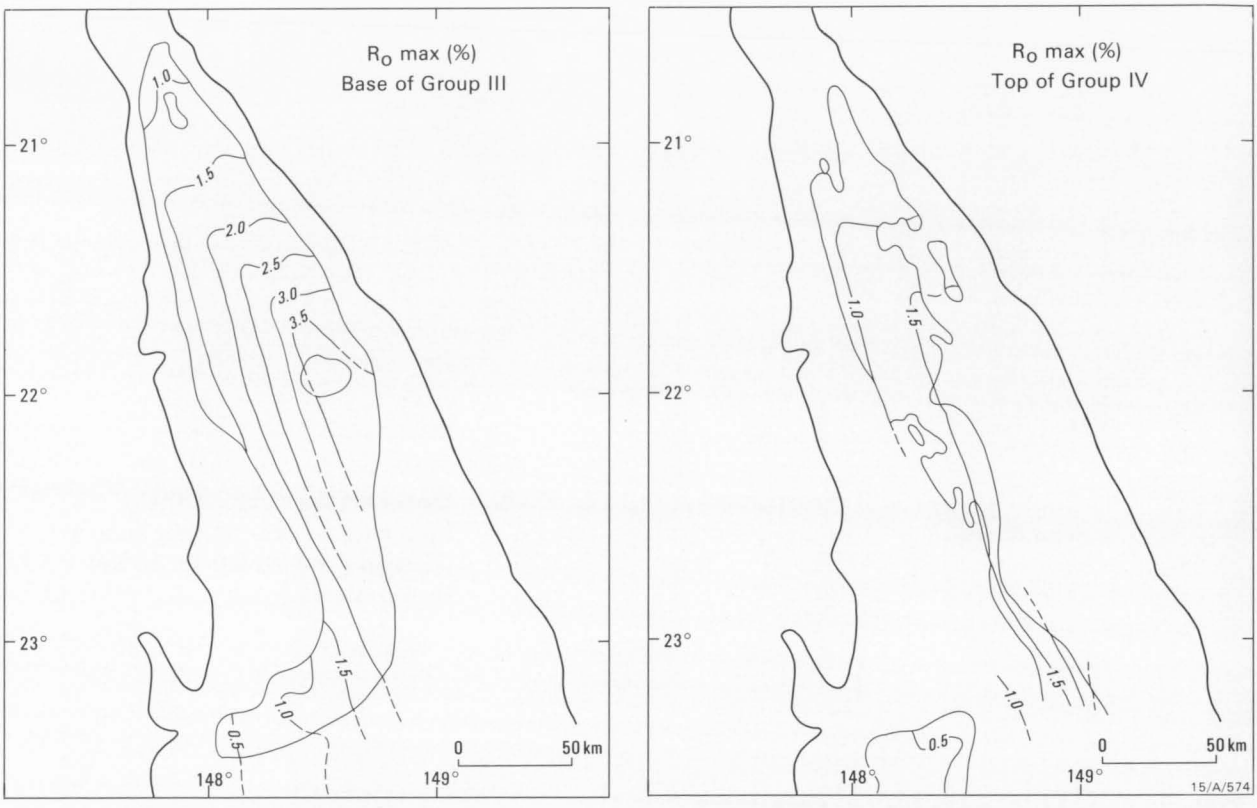

Fig. 25–10. Isoreflectance map of the German Creek Formation and equivalent coals in the Bowen Basin.

Interpretation of Regional Coal-Rank Variation

Regional Rank Maps

Coal-rank variation for each of the eastern Australian Permian coal basins was presented earlier in this chapter; these data are now integrated to give regional coal-rank trends. An interpretation of both continent and basin-wide trends of rank are discussed here.

Plate 24 shows a surface reflectance map for eastern Australia, but the values of reflectance on this map do not necessarily refer to Permian rocks. The uncontoured regions are those of igneous or metamorphic rocks. The reflectance values are of sedimentary rocks at the surface or in the immediate subsurface (solid geology). This map has important tectonic implications, especially in regard to maximum palaeotempertures of the present-day surface of sedimentary rocks. It appears that eastern Australia has suffered one or more continent-wide erosional events since Late Mesozoic times. The 0.6% isoreflectance contour

may represent the boundary between severe uplift and erosion, as well as moderate to slight denudation; this contour runs sub-parallel to the present-day coast. A major tectonic province is delineated by the region between the 0.6% isoreflectance contour and the eastern Australian coastal margin. Additional uplift and intrusive activity has occurred along this axis since Carboniferous times (Korsh & Harrington, 1981).

Shaw (1979) has concluded that the eastern Australian continental margin is in part a "sheared" margin rather than of the classical "pull-apart" type. Essentially, sea-floor spreading that formed the Tasman Sea was in places oblique to the continental margin. Therefore, the Australian continental margin originated by a series of transform faults (sheared margin) and regular pull-apart ridges (rifted margin). He concluded that heating associated with the sea-floor spreading would have had little effect on the continental crust of mainland Australia.

Plate 25 shows isoreflectance contours on the Upper Permian coal measures in eastern Australia; these are the Illawarra and Newcastle Coal Measures of the Sydney Basin, Rangal Coal Measures and equivalents in the Bowen Basin, the Bandanna Formation in the Galilee Basin, the Black Jack Formation of the Gunnedah Basin, and the Toolachee Formation of the Cooper Basin. No contours are drawn where no Upper Permian exists or has been lost.

Plate 26 offers isoreflectance contours map of Lower Permian coals in eastern Australia, which comprises the composite data of Greta Coal Measure of the Sydney Basin; i.e., from the Collinsville Coal Measure age of the Bowen Basin, "Lower Coal Measures" and equivalents data of the Gunnedah Basin; from the Aramac Coal measures of the Galilee Basin; and from the Patchawarra Formation in the Cooper Basin. Lower Permian rank data are patchy and the trends in Plate 26 are not as comprehensive as in Plate 25. However, both Plates 25 and 26 indicate similar trends. As expected from Hilt's Law, the rank in the Plae 26 map is greater than that of the Upper Permian map.

An interpretative map of coal-rank trends in the Permian of eastern Australia is given in Plate 27.

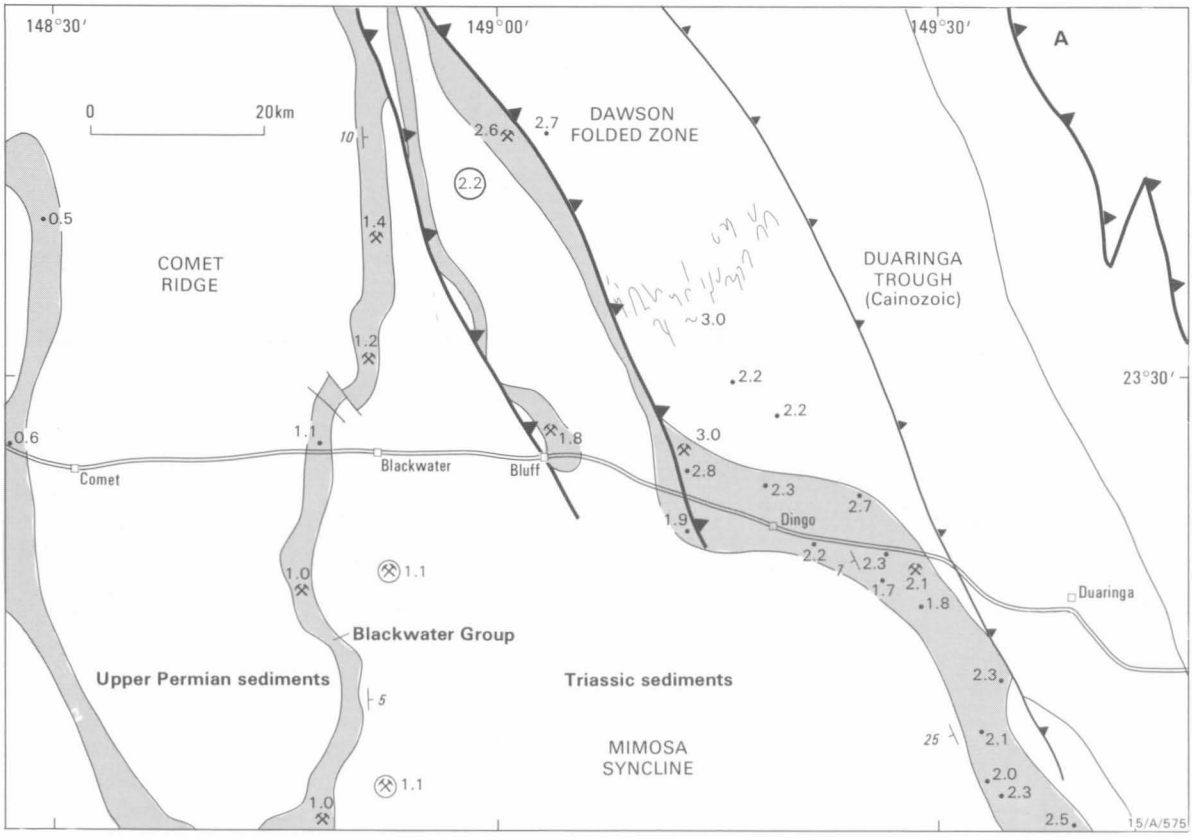

Fig. 25–11. Reflectance and geological information for the southern part of the exposed Bowen Basin.

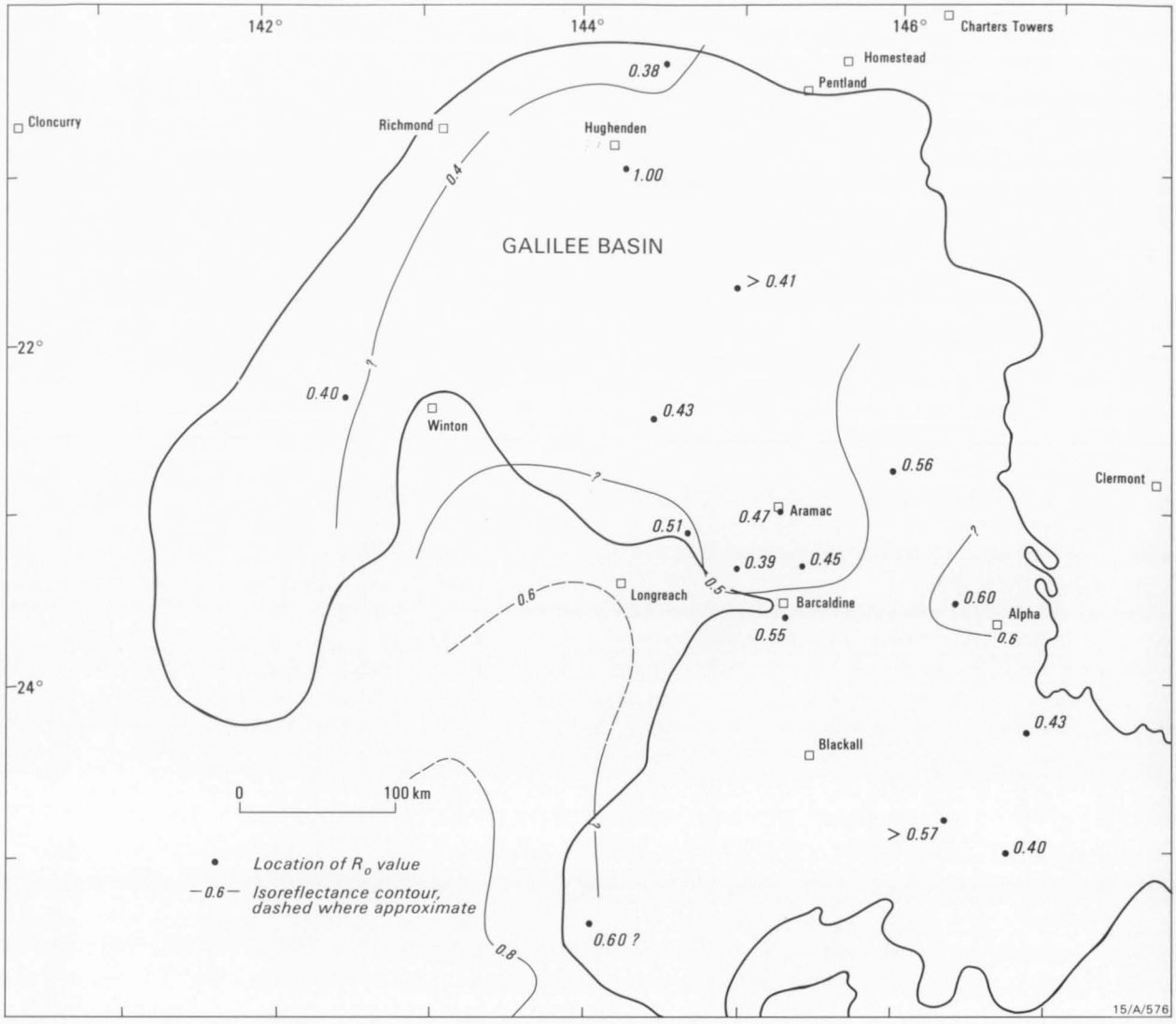

Fig. 25–12. Isoreflectance map of Upper Permian in the Galilee Basin.

Interpretation of Sydney Basin Coal-Rank Trends

Surface vitrinite reflectance of the Sydney Basin can be closely correlated to palaeotemperatures in the basin. Middleton & Schmidt (1982) estimated palaeotemperatures in the basin based on coal rank and magnetization studies. They estimated that present-day surface rocks in the coastal region to have been exposed to temperatures in the vicinity of 250°C, whereas those west of a line drawn down the centre of the basin (see Plate 27) to temperatures far less than those to the east.

The elevated coal rank along the eastern and northeastern margins of the basin are due to considerable depth of burial. Middleton (1982) and Middleton & Schmidt (1982) have estimated some two or more kilometres of sediment that have been lost by erosion along the eastern margin.

The Gloucester Basin, some 50 km north of the Sydney Basin, has a coal reflectance of about 0.9%. The Gloucester Basin is situated in up-faulted blocks of Carboniferous age. Clearly, the coastal uplift and erosion trend continues into the New England Fold Belt.

Similarly, the Ashford Coalfield, also on the western edge of the New England Fold Belt, has reflectances from 1.02% to 1.11%. The trend of high surface reflectances runs sub-parallel to the New South Wales coastline.

The uplifted coastal strip is closely parallel to a fault-line identified by Harrington (personal communication, 1981). Repeated movements along the fault, stimulated by peripheral tectonic events, is suggested as the cause of the uplift, followed by erosional exposure of sediments to the east of the fault-line. Preliminary thermal events associated with Tasman Sea opening probably resulted in reactivation of the fault zone in New South Wales.

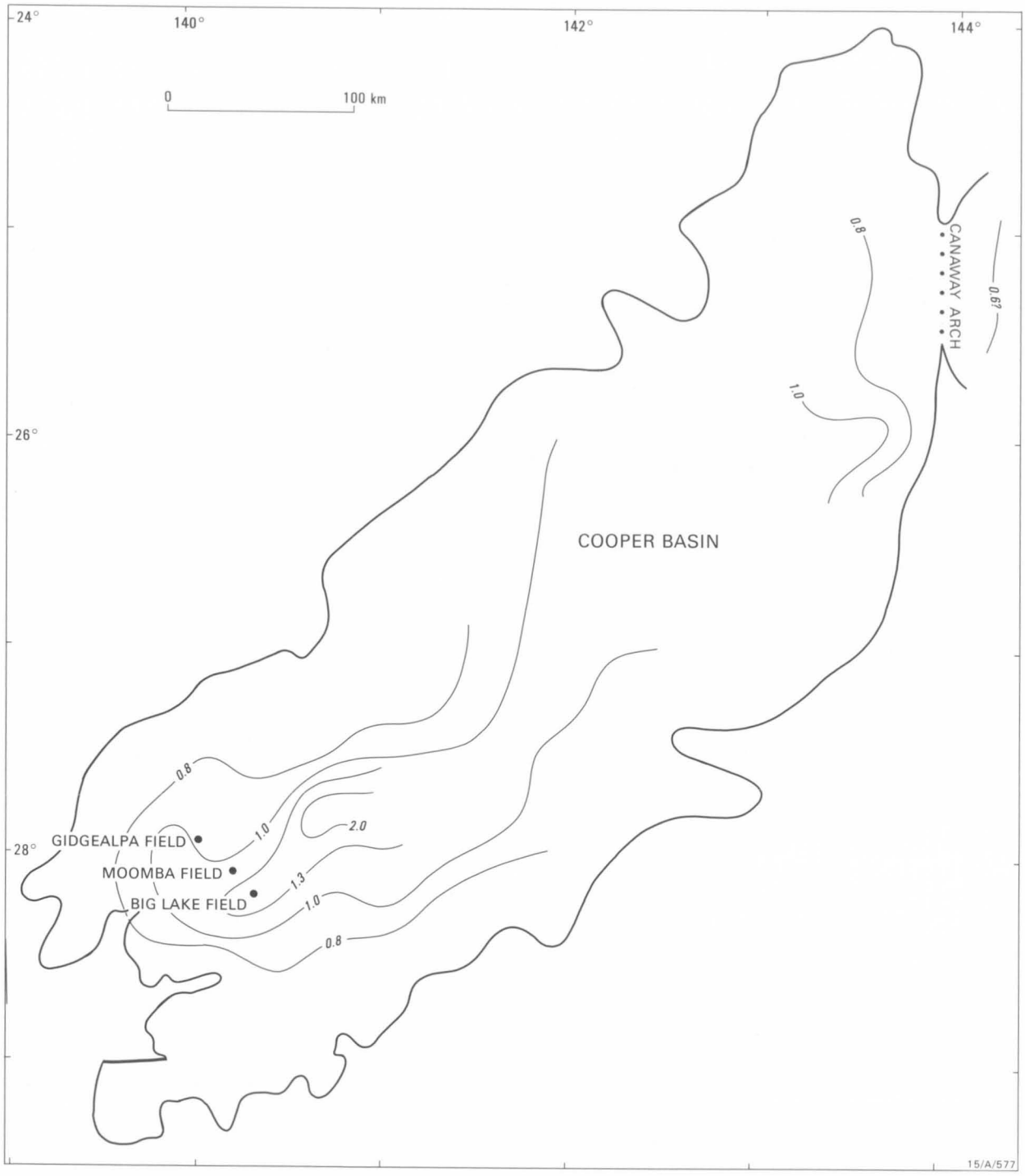

Fig. 25–13. Isoreflectance map of Upper Permian in the Cooper Basin.

Interpretation of Bowen Basin Coal Rank Trends

Coal rank trends in the Bowen Basin are dominant in the Dawson Folded Zone (Dawson Folded Zone and Gogango Folded Zone). Three periods of uplift and erosion can be identified from the Northern Bowen Basin geology, which have contributed to the present rank patterns. The initial period of deformation accompanied the folding of both the Dawson Folded Zone and Gogango Folded Zone. An uplift of several kilometres may have occurred. A second period of deformation took place during Upper Triassic times, when thrusting from the east was activated and significant uplift and erosion followed. A third uplift–erosion period occurred when Jurassic and possibly Cretaceous sediments were lost; which is probably of Late Cretaceous or Early Tertiary age.

A typical coalification–versus–depth curve for the buried portion of the Bowen Basin is the

Wandoan Curve of Shibaoka & others (1973). Additional curves from the unexposed part of the basin are shown in Fig. 25–6b.

Some uplift occurred in Early Tertiary times, exposing part of the basin. Nevertheless, the continuity of the reflectance–versus–depth curves suggests little tectonic activity in the Bowen Basin south of Theodore from Permian to Cretaceous times.

Tectonism in the Bowen Basin, especially in the north, appears to have been controlled by the large north–south fault system identified by Harrington. Reactivation along this fault appears to have caused the uplift during the three tectonic periods in the northern Bowen Basin. Plate 27 shows a splay fault, resulting in tilting of the Dawson Folded Zone north of Theodore; the rank increase north of Theodore into the Dawson Folded Zone at Baralaba (Plate 25) reflects this tilting.

Vitrinite reflectances in excess of 3% (anthracite) in the Folded Zone seem to have been formed at several kilometres depth, followed by uplift during the subsequent tectonic periods (Shibaoka & Bennett, 1976). Other hypotheses, such as heating from igneous activity, frictional heating, and tectonic stress, have also been proposed to explain the anthracite. The overall presence of semi-anthracite in the Folded Zone is explained well by burial and uplift.

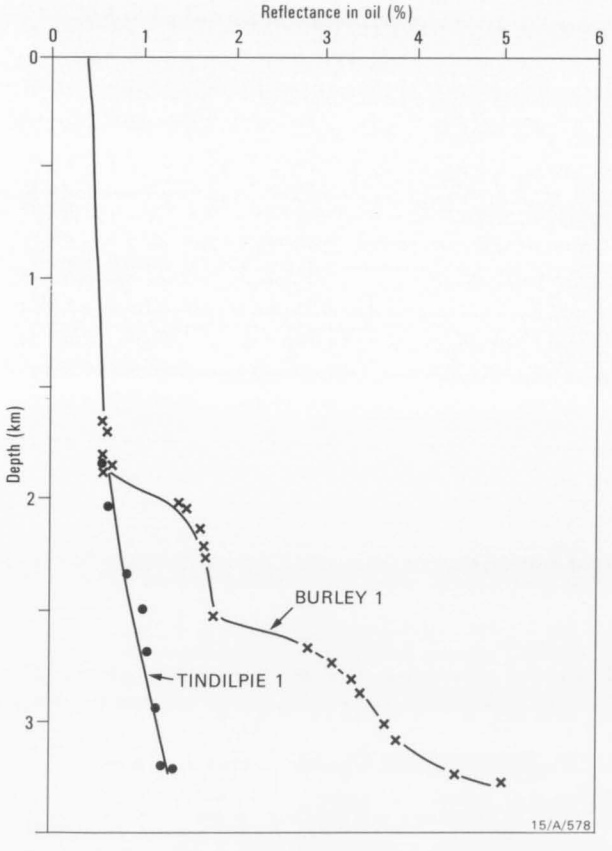

Fig. 25–14. Vitrinite reflectance versus depth for Tindilpie-1 and Burley -1 in the Cooper Basin (after Kantsler & others 1978).

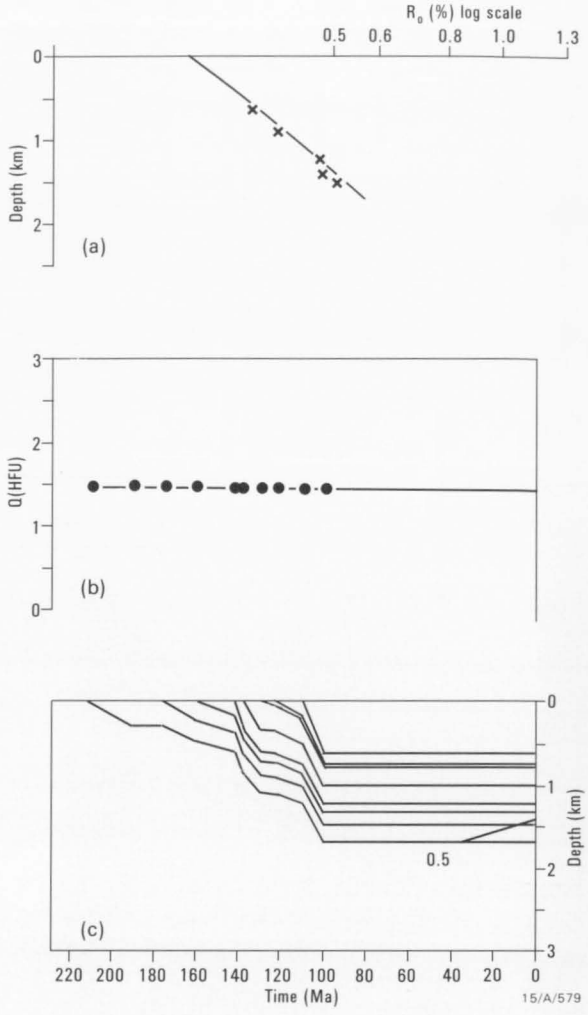

Fig. 25–15. Geohistory plots of Boomi -1 from the southern Bowen Basin and Dural South -1 from the Sydney Basin.

Gunnedah, Galilee and Cooper Basin Coal-Rank Interpretation

Figure 25–16 compares the reflectance–versus–depth curves for the buried Bowen Basin (Wandoan curve of Shibaoka & others, 1973), the Gunnedah Basin (Wee Waa-1, Fig. 25–6), the Galilee Basin (Aramac-1, from Hawkins & Balfe, 1980), and the Cooper Basin curves (from Fig. 25–14). These curves show a similarity of coalification conditions with reflectances less than 1% for depths less than 2 km. This reflectance trend suggests coalification owing to burial under moderate geothermal gradient and little uplift after the cessation of Mesozoic sedimentation. Surface reflectances in these basins are of the order of 0.4% to 0.5%.

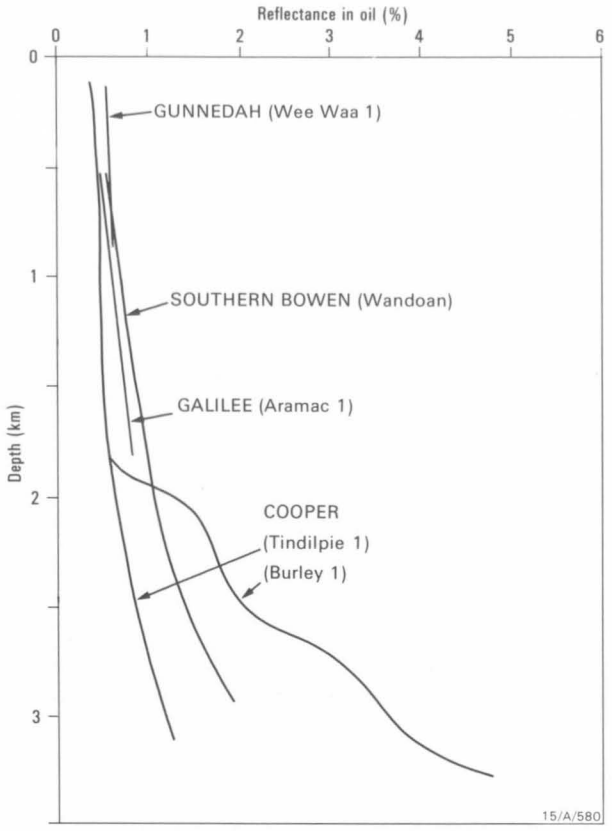

Fig. 25–16. Vitrinite reflectance versus depth for the Wandoan curve (Shibaoka & others, 1973), Wee Waa -1, Aramac -1, and Tindilpie -1 and Burley -1.

The coalification model of equation (25–4) can be used to calculate the expected virtrinite reflectance, Ro, if the surface phytoclasts were buried since Cenomanian times (100 Ma ago) at a temperature of 30°C (indicating very little overburden). Equation (25–4) in this situation becomes:

$$Ro = [2.8 \times 10^{-6} t_1 \exp(0.069T)]^{0.182} \qquad (25–5)$$

Substituting t = 100 and T = 30°C, then Ro = 0.33%. This calculation indicates that the surface reflectances in these basins are only slightly larger than those expected from a basin that has undergone very little uplift since sedimentation ceased in Late Mesozoic times.

In general, the more westerly situated basins exhibit coalification by burial. The rank of the deeply buried Permian sediments is a function of geothermal gradient during Mesozoic times.

Conclusion

Coal-rank variation in eastern Australian Permian coal basins is controlled by maximum depth of burial, but the surface rank is essentially due to post-Permian tectonics. Present-day surface rocks along the eastern margin of the Sydney Basin are shown to have experienced palaeotemperatures of the order of 200°C. On the contrary, coals in the Dawson Folded Zone of the Bowen Basin have been heated by temperatures significantly greater than 200°C.

Plate 27 presents the summary of interpretation of coal-rank trends in the eastern Australian Permian coal basins. The easterly Sydney and Bowen basins and the eastern edge of the Gunnedah Basin are affected by the reactivation of the Late Carboniferous transform fault of Harrington. The westerly basins show coalification owing to simple burial, although a discontinuity in coalification appears to have occurred during the Triassic and Jurassic in the Cooper Basin.

Coalification can be modelled by simple first-order reaction kinetics, and the model of Royden & others (1980) explains well the observed coalification in Permian and Mesozoic coals in eastern Australia. This model is used to calculate the original depth of cover over the Sydney Basin to have been between 1 km and 2 km, and more than 3 km in the Folded Zone of the Bowen Basin.

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CHAPTER 26

Palaeothermometry of the Sydney Basin[1]

by
M.F. Middleton & P.W. Schmidt

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1. Reproduced verbatim, with only minor editorial changes, from the Journal of Geophysical Research; see Selected Bibliography.

Introduction

There is strong evidence that rocks exposed at the surface of the Sydney Basin may have been raised to temperatures of 200°C or higher. This evidence is derived from observations of overprinting of magnetizations in Late Permian and Early Mesozoic rocks which were rapidly cooled 70–100 Ma ago (Schmidt & Embleton, 1981). The blocking and stabilization of the overprint magnetizations are related to uplift, erosion, and rapid supracrustal cooling. High surface coal ranks in the Sydney Basin support these conclusions.

Important information on tectonic and thermal histories of sedimentary basins can be obtained from the degree of diagenesis of organic sediments. The reflectivity of the coal maceral, vitrinite, is known to increase regularly with coal rank, which is itself related to the thermal and tectonic history of a basin. A number of workers have demonstrated that organic diagenesis proceeds predictably as a function of temperature variation with time and that this relationship can be used to predict organic diagenesis (or coal rank) in terms of vitrinite reflectance in a developing sedimentary basin (Shibaoka & Bennett, 1977; Turcotte & McAdoo, 1979; Royden & others 1980; Falvey & Middleton, 1981). Table 26–1 shows the correlation of coal rank to the reflectance of vitrinite in oil.

TABLE 26–1. CORRELATION OF VITRINITE REFLECTANCE TO COAL RANK

Coal rank	*Mean vitrinite reflectance in oil (%)*
Peat-lignite	0.2–0.4
Sub-bituminous	0.4–0.6
High volatile bituminous	0.6–1.1
Medium volatile bituminous	1.1–1.5
Low volatile bituminous	1.5–1.9
Semi-anthracite	1.9–2.5
Anthracite	2.5–6.0

This paper combines a tectonic burial model of the Sydney Basin with the thermodynamic model of coalification in order to corroborate the findings of Schmidt & Embleton (1981). Further evidence for burial of the basin comes from petrographic studies by Raam (1968), who found the regional occurrence of the metamorphic minerals, laumontite and prehnite, in Permian sandstones. Sedimentation probably extended into Jurassic times, as sediments and tuff with Early Jurassic microflora have been reported in several breccia pipes within the basin (Crawford & others, 1980). A major uplift and erosional event, which denuded the basin of its Jurassic and part of its Triassic sediments, was probably associated with the initiation of seafloor spreading in the Tasman Sea on the eastern margin of the Sydney Basin.

Regional Geology

The Sydney Basin (Fig. 26–1) is one of an interconnected network of Permo-Triassic basins in eastern Australia. The basin has an unknown maximum thickness of sediment, probably exceeding 4 km, which thins towards the western and southern margins. The depositional and tectonic history of the basin has been well described in the literature (Conolly & Ferm, 1971; Mayne & others, 1974; Herbert, 1980).

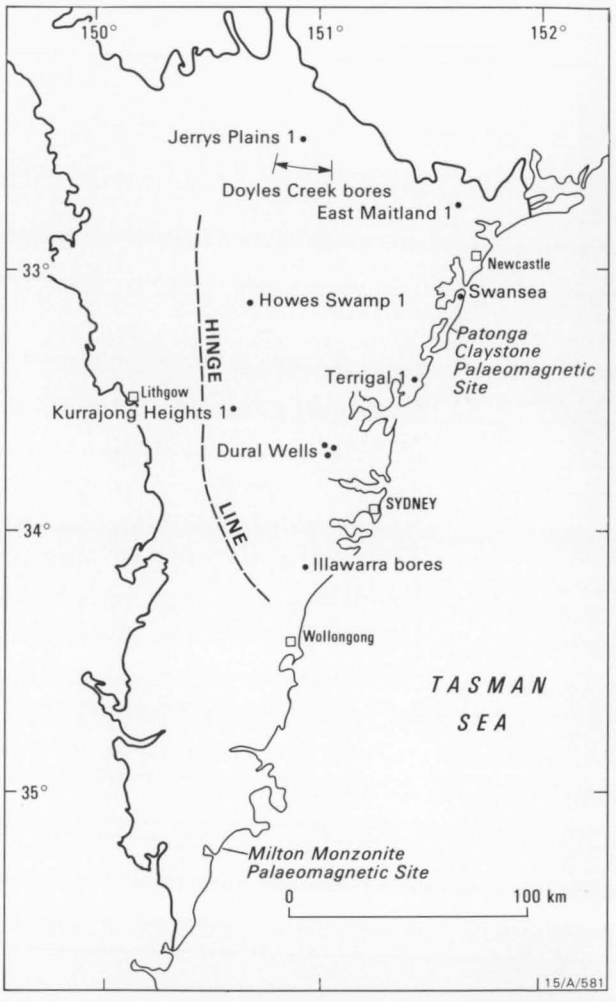

Fig. 26–1. Location map of the Sydney Basin, showing the locations of nine sites from which vitrinite reflectance versus depth data were obtained (EM, East Maitland No. 1; JP Jerrys Plains, No. 1; DC, Doyles Creek bores; HS, Howes Swamp No. 1; SW, Swansea; TG Terrigal No.1; DW, Dural wells; Ib Illawarra bores; KH, Kurrajong Heights No. 1).

Thick sequences of marine sediments were deposited in the Sydney Basin during the Early Permian; a transgression in the northern part of the basin was followed by a regression that allowed

the deposition of the Greta Coal Measures, about 270–260 Ma ago. Deposition in the late Permian and Early Triassic took place essentially in marginal to fluvial environments with numerous coal swamps. Deposition is postulated to have extended into Jurassic times with an hiatus in the Late Triassic (Herbert, 1980). A north–south trending 'hinge line' (Fig. 26–1), which is suggested to be governed by Pre-Permian tectonics (H.J. Harrington, personal communication, 1981), separates a thick sequence of sediments to the east from a thin sequence on the shelf to the west.

Volcanism and intrusive activity occurred continuously in the Sydney Basin through the Triassic and Jurassic (Mayne & others, 1974; Wellman & McDougall, 1974; Crawford & others, 1980). A regional geothermal gradient higher than the continental average of 1.2 HFU (10^{-6} cal cm^{-2} s^{-1})* probably existed throughout this time, with localized geothermal gradients fluctuating considerably.

Uplift associated with the onset of seafloor spreading (Falvey, 1974) in the Tasman Sea probably instigated an erosional episode which denuded the Sydney Basin of Jurassic and some Triassic sediments. Seafloor spreading in the Tasman Sea commenced 76 Ma ago (Shaw, 1978, 1979), which compares favorably with the blocking ages of the overprint magnetizations measured by Schmidt & Embleton (1981).

Some erosion and igneous activity extended through the Tertiary; a significant uplift event caused elevation of the western part of the Sydney Basin. However, this later event would have had little effect on temperatures within the basin, as erosion occurred by rivers dissecting the uplifted plateaus and negligible temperature and coal rank increase would have occurred since the major erosional event associated with Tasman Sea opening some 70 Ma earlier.

* Editorial comment: This and all other footnotes have been added to the present chapter prepared during 1987. Note that 1HFU = 41.84 mWm^{-2}, so that 1.2HFU = 50.2 mWm^{-2}. Also note: 1 cal $cm^{-1}S^{-1}$ = 418.4 $Wm^{-1}K^{-1}$.

Model of Coalification

Coalification is commonly modeled as a first-order chemical reaction with the reaction rate doubling every 10°C temperature increase. Royden & others (1980) have related a thermal alteration parameter, C, to temperature and time with the above assumption of reaction rate:

$$C = \ln \int_0^t 2^{T(t)/10} dt, \quad (1)$$

where T(t) is a temperature as a function of time t. They relate vitrinite reflectance in oil, R_o, to C, graphically; their graph describes the relation

$$\log (R_o) = b' + a'C, \quad (2)$$

where a' and b' are constants. Substitution of (1) into (2) and rearrangement of terms gives

$$(R_o)^a = B \int_0^t \exp [bT(t)] dt, \quad (3)$$

where R_o is vitrinite reflectance in percent, T is temperature in °C, t is time in Ma, a = 5.5, B = 2.8 x 10^{-6}, and b = 0.069. Shibaoka & Bennett (1977) proposed a graphical method to determine coal rank increase with temperature and time which is equivalent to (3) with slightly different values of the constants a, b, and B.

Dow (1977) described the common observation that a plot of the logarithm of vitrinite reflectance, log (R_o), versus depth for deep bores or petroleum exploration wells produces a linear curve. He suggested that linearity of the log (R_o) versus depth plot may be an inherent feature of the coalification process. These observations cannot be generally reconciled with (3). However, for a rapidly deposited sequence subsequently maintained undisturbed for its remaining geological history of duration t_2 with a geothermal gradient G_2, (3) becomes

$$(R_o)^a = B \int_0^{t_2} \exp [b(T_o + G_2 z)] dt, \quad (4)$$

where T_o is the surface temperature and z is depth; the coalification during subsidence is neglected. Integrating the righthand side of (4) and rearranging terms,

$$\log (R_o) = \log[Bt_2 \exp (bT_o)]^{1/a} + \{[bG_2 \log (e)]/a\}z, \quad (5)$$

which is a logarithmic relationship of the form suggested by Dow (1977). This has been discussed previously by Middleton (1982).

Tectonic Model

Middleton (1982) has used (3) to give predicted vitrinite reflectance versus depth relationships for a number of simple tectonic histories. The Sydney Basin tectonic history is essentially one of subsidence through Permian to Early Jurassic times, stable conditions from the Late Jurassic to 100–70 Ma ago, followed by rapid uplift and erosion, and

then minor vertical movements until a final uplift in Late Tertiary times. Events after the rapid uplift and erosion had little effect on coal rank, and may be modeled as a period of quiescence with low geothermal gradient. The tectonic model is (1) subsidence at a rate V for a duration t_1 with geothermal gradient G_1; (2) no vertical movement for a duration t_2 with geothermal gradient G_2; (3) rapid erosion of thickness h in response to rapid uplift with geothermal gradient G_2; and (4) quiescence to the present day (a duration t_3) with geothermal gradient G_3 less than or equal to G_2.

The vitrinite reflectance as a function of depth z for the above tectonic history is given from (3) by

$$(R_o)^a = B \exp(bT_o) \{\exp[bG_1(z + h)] - 1\} / bG_1V + Bt_2 \exp[bT_o + bG_2(z + h)] + Bt_3 \exp[bT_o + bG_3z]. \quad (6)$$

Unless $G_1 = G_2 = G_3$ in (6), log (R_o) versus depth z is not linear. However, an examination of the magnitude of the terms in (6) reveals that the term containing t_2 and G_2 is typically an order of magnitude larger than the other terms. Therefore, the relationship of log (R_o) to depth is very nearly linear.

Oscillograms or depositional history plots of Sydney Basin stratigraphic data from deep bores (Mayne & others, 1974) indicate that a constant subsidence rate gives a good approximation to Permian and Triassic subsidence in many bores. The subsidence rate is variable throughout the basin, being about 0.05 km Ma^{-1} in the north and center of the basin and about 0.03 km Ma^{-1} in the south. Turcotte & Ahern (1977) and McKenzie (1978) have demonstrated that geothermal gradients in newly forming basins are significantly higher than stable continental regions. The heat flow might be expected to be in the order of 2.5 HFU*, which gives a geothermal gradient of 50°C km^{-1} if a sediment thermal conductivity of 5×10^{-3} cal cm^{-1} s^{-1} $°C^{-1}$ ** is assumed. The present-day geothermal gradient G_3 in the Sydney Basin is approximately 24°C km^{-1} (Sass & others, 1976) which has probably been maintained for the past 70 Ma (t_3).

The geothermal gradient G_2 from the end of deposition to the uplift associated with Tasman Sea rifting was higher than the continental average of 24°C km^{-1}, but probably fluctuated considerably with periods of igneous activity. The duration of this period (t_2) is unknown and depends on the age at which sedimentation ceased and the age at which the rapid uplift and erosion began. Schmidt & Embleton (1981) place the age of uplift and erosion between 100 and 70 Ma: the youngest microflora reported in the Sydney Basin is Early Jurassic (Helby & Morgan, 1979). Therefore, the period t_2 is probably in the range of 70–110 Ma.

Thickness of erosion, h, is well in excess of 1 km (Schmidt & Embleton, 1981). The relative orders of magnitude of the terms on the right-hand side of (6) are determined at a depth z = 0, assuming T_o = 15°C, V = 0.05 km Ma^{-1}, G_1 = 50°C km^{-1}, t_2 = 100 Ma, G_2 = 40°C km^{-1}, t_3 = 80 Ma, G_3 = 24°C km^{-1}, and h = 1 km:

$$\begin{aligned} &B \exp(bT_o) \{\exp[bG_1(z + h)] - 1\} / bG_1V = 1.39 \times 10^{-3} \\ &Bt_2 \exp[bT_o + bG_2(z + h) = 1.25 \times 10^{-2} \\ &Bt_3 \exp[bT_o + bG_3z] = 6.31 \times 10^{-4}. \end{aligned} \quad (7)$$

The last term in (7) is considerably smaller than the other two terms and indicates that the coalification gradient is effectively 'frozen' into the basin at the time of the rapid erosion. The second term in (7) dominates by an order of magnitude, and therefore (6) is well approximated by

$$(R_o)^a = Bt_2 \exp[bT_o + bG_2(z + h)], \quad (8)$$

which is equivalent to (5). For typical Sydney Basin tectonic parameters, a linear log (R_o) versus depth curve is to be expected.

The slope of the log (R_o) versus depth plot is a function of the geothermal gradient G_2:

$$\frac{d \log(R)}{dz} = \frac{bG_2 \log(e)}{a} = \frac{G_2,}{183.5} \quad (9)$$

where depth is measured in kilometres. Consequently, an estimate of G_2 which is independent of the other parameters can be obtained from the data.

The reflectance at the surface R_{0s}, given by (8) is

$$R_{0s} = [Bt_2 \exp(bT_o - bG_2h)]^{1/a}. \quad (10)$$

Surface vitrinite reflectance is easily measured or determined by extrapolation of the linear log (R_o) versus depth plot, G_2 is determined by the slope of the data plot, and the range of t_2 is known. Therefore a range of calculated values for the eroded thickness h can be found from (10) for a set of vitrinite reflectance versus depth data from a deep bore. Middleton (1982) has applied this procedure to data from the Howes Swamp 1 well in the Sydney Basin.

The inherent problem with this model is that a constant geothermal gradient G_2 is assumed to exist over the time span t_2, a time span of the odes of 100 Ma. Clearly, G_2 can only represent an 'effective' palaeogeothermal gradient, which will be the averaged effect of the fluctuating geothermal gradient during the time span t_2. The effective palaeogeothermal gradient G_2 is the only clue to the palaeothermal conditions during the period of major coalification. However, the fluctuating palaeogeothermal gradient immediately prior to uplift, which was probably the maximum

* 2.5HFU = 104.6 mWm^{-2}

** 5×10^{-3} cal $cm^{-1}S^{-1}$ $°C^{-1}$ = 2.1 $Wm^{-1}K^{-1}$

palaeogeothermal gradient, influenced the overprint magnetization directions rather than G_2. Nevertheless, G_2 can provide a good estimate of h when substituted into (10).

Vitrinite Reflectance

Figure 26–1 shows the locations of nine deep bore sites in the Sydney Basin from which vitrinite reflectance versus depth data were obtained. Figure 26–2 shows plots of log (R_o) versus depth of these data. Curves for East Maitland 1, Swansea, and Terrigal 1 are from Diessel (1973). The data are sparse from Kurrajong Heights 1 in the central west of the basin, but they are all that are presently available. A straight line has been drawn visually through the East Maitland and Swansea curves, and least squares regression has been used to fit straight lines to the other data. The regression equations and effective palaeogeothermal gradient G_2 from (9) for each of the nine wells are shown in Table 26–2.

TABLE 26–2. REGRESSION EQUATIONS AND G_2 from (26–9) FOR THE NINE DEEP BORE SITES IN THE SYDNEY BASIN

Bore/well	*Regression equation, log* (R_o)	G_2(°C km^{-1})
East Maitland No. 1	–0.108 + 0.145z	26.6
Jerrys Plains No. 1	–0.193 + 0.266z	48.8
Doyles Creek bores	–0.146 + 0.205z	37.6
Howes Swamp No. 1	–0.339 + 0.240z	44.0
Swansea	–0.150 + 0.243z	44.7
Terrigal No. 1	–0.172 + 0.240z	44.0
Dural wells	–0.192 + 0.343z	62.9
Illawarra bores	+0.045 + 0.221z	40.6
Kurrajong Heights No. 1	–0.349 + 0.281z	51.5

NOTE: The first coefficient in the regression equation is the logarithm of the surface vitrinite reflectance, log (R_o).

Figure 26–3 shows the effective palaeogeothermal gradient for the nine Sydney Basin sites. The gradients are highly variable and insufficient data exist to predict any trends. However, it appears that an effective palaeogeothermal gradient of approximately 40°C km^{-1} existed regionally throughout the basin.

A contour map of surface vitrinite reflectance is shown in Fig. 26–4. This map is based on extensive reflectivity data (in the CSIRO data base) from the numerous collieries in the Sydney Basin, and extrapolation of data from shallow and deep bores. The surface vitrinite reflectance decreases with distance from the coast, and a peak occurs on the coast between Sydney and Wollongong.

Thermal Activation of Magnetization

Turning to magnetic parameters, the relationship between the relaxation time t of the remanent magnetization of an assembly of non-interacting single-domain grains proposed by Néel (1949) is

$$t = \tfrac{1}{2} f_o \exp [vJ_s(T_B)H_K(T_B)/2kT_B], \qquad (11)$$

where f_o is the fluctuation rate (approximately 10^{10}s^{-1}), v is volume, J_s is the spontaneous magnetization, H_k is the intrinsic coercivity, k is Boltzmann's constant, and T_B is the blocking temperature (K), below which t dramatically rises. The fundamental implication is that for an assembly of magnetic grains there exists a time temperature (t, T) field governing the remobilization or activation of the magnetization. For a particular grain the quantity $T\ 1n(2f_o t)/J_s(T)H_k(T)$ is a constant, yielding a thermal activation (TA) contour in the (t,T) field. TA nomograms for assemblies of pure magnetite and pure hematite grains (Paullaiah & others, 1975) show that it is possible to activate the moments of such grains with moderate laboratory blocking temperatures at much lower temperatures, given sufficient time. This corresponds to their field, B, and gives an explanation for viscous remanent magnetization (VRM). On the other hand, grains with high laboratory blocking temperatures are stable for geologically long times even at elevated temperatures, i.e., their field A. However, experimental evidence produced by Pullaiah & others suggests that thermal activation may be more potent than theory allows, and as Dunlop & Buchan (1977) conclude, such findings cast serious doubt on the quantitative use of this theory, at least until the reason for the discrepancy is determined. Thus, considering magnetic overprinting alone, Schmidt & Embleton (1981) were only able to suggest maximum temperatures to which the rocks now exposed in the Sydney Basin have been elevated since deposition.

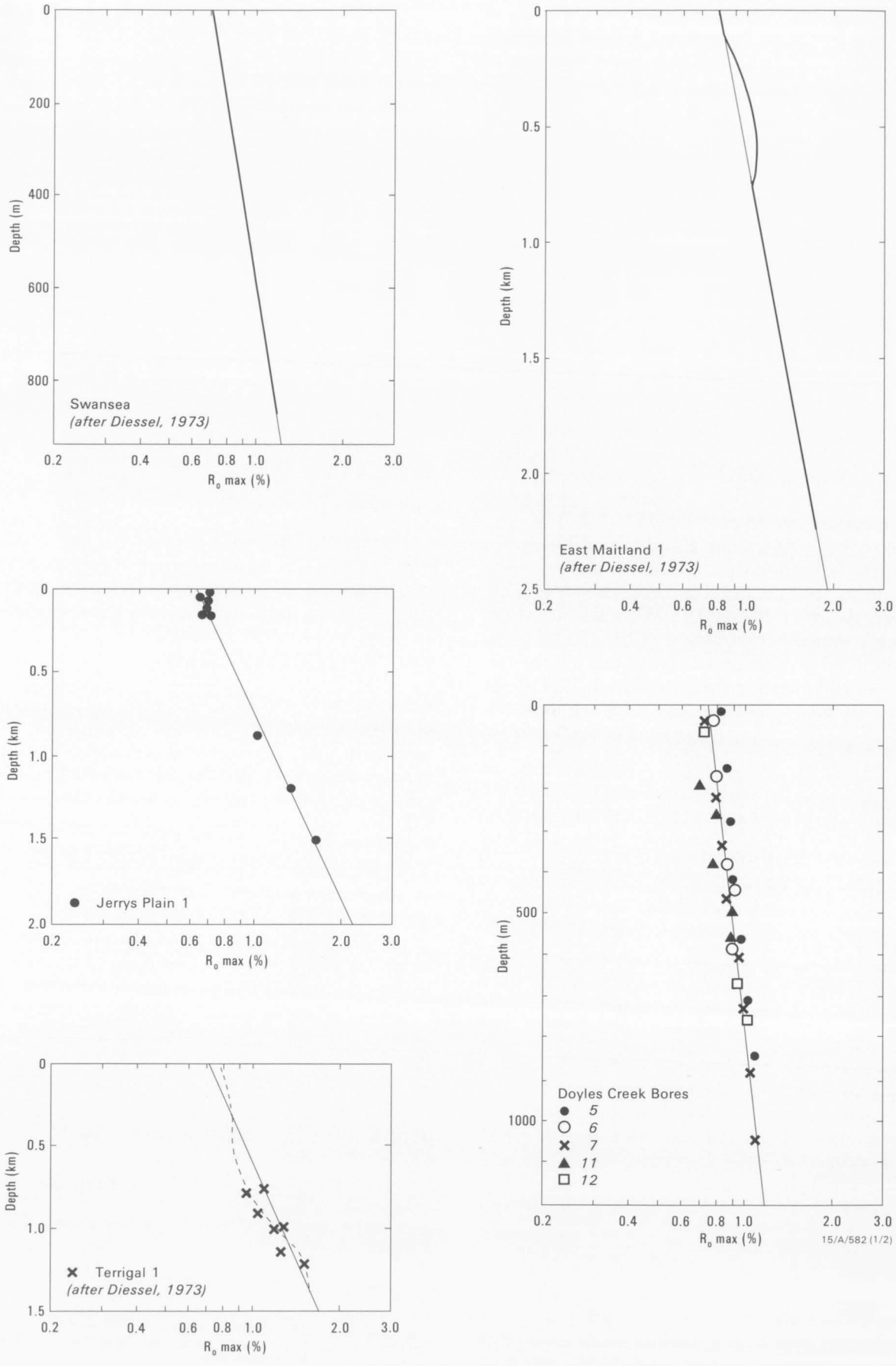

Fig. 26–2. Plots of the logarithm of vitrinite reflectance, log(R_o), versus depth (z) for the nine sites. Regression curves are shown plotted to the data; the equations of these curves are given in Table 26–2.

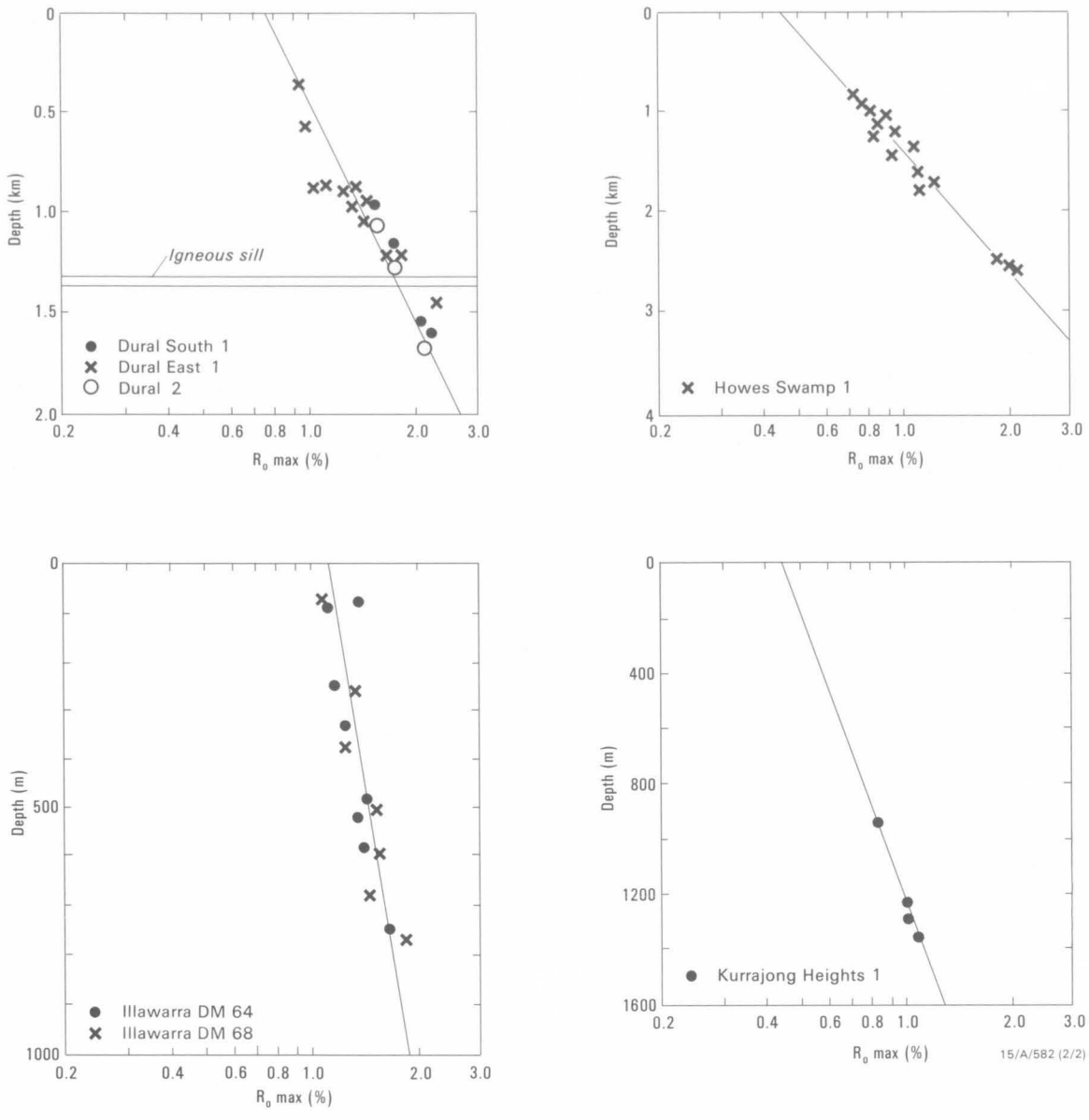

Fig. 26–2.

Using a different approach, Walton (1980) recently developed a theory dependent on grain-size distribution in which TA contours represent constant values of $T\ 1n^2(2f_ot)/(J_s(T)H_k(T))$, assuming an approximately log normal grain-size distribution. Thermal activation diagrams thus generated are plotted for pure magnetite and hematite in Figs 26–5a and 5b. The usual assumption that shape anisotropy dominates in nonspherical magnetite grains leads to the relationship $H_k(T)\alpha J_s^3(T)$, and the relationship $H_k(T)\alpha J_s^3(T)$ was used for hematite, following Pullaiah & others (1975). Values of $J_s(T)$ have been taken from Fig. 26–2 of Pullaiah & others (1975). The resulting contours reveal diminished A fields, compared with those of Pullaiah & others. That is, Walton's theory is more closely in accord with the experimental results, and suggests that the earlier discrepancy may be attributable to grain-size distribution.

Applying Walton's theory for VRM acquisition at elevated temperatures to the existing thermal demagnetization data from overprinted rock bodies in the Sydney Basin should provide tighter temperature constraints than those previously deduced (Schmidt & Embleton, 1981). Since the temperature dependence of spontaneous magnetization, $J_s(T)$, is best known for pure magnetite and hematite, only data from rocks bearing these minerals have been considered. Schmidt & Embleton showed that the only detectable magnetic carrier in the Milton Monzonite is magnetite with a Curie temperature of 578°C, while the magnetic carrier in the Patonga Claystone is hematite with a Curie temperature in excess of 660°C (Embleton & McDonnell, 1980). Furthermore, the direction of the overprint magnetizations of these two bodies are parallel, strongly suggesting they have been caused by the same event. If overprint unblocking

temperatures were precisely known, a unique (t, T) solution for the Sydney Basin could be achieved by solving simultaneously for different minerals; in this instance, magnetite and hematite. However, by the very nature of the step-wise aquisition of thermal demagnetization data, it is difficult to define the exact temperature at which a magnetic component of any particular specimen is demagnetized, but by averaging over many specimens we consider that the actual laboratory temperatures are estimated to be better than 10°C. Error from this source could be reduced by using smaller increments during thermal demagnetization and/or by processing a larger number of specimens. Another source of error arises from not knowing the effective time of the heating cycle. This is minor, however, because it is the logarithm of time that is involved in the analysis. In fact, because the log is involved, this factor may be the best-known variable. Thus, the laboratory (t_l, T_l) fields for magnetite and hematite may each be transformed into a range of possible geophysical counterparts, their intersection yielding an estimate of the actual geophysical conditions (t_a, T_a).

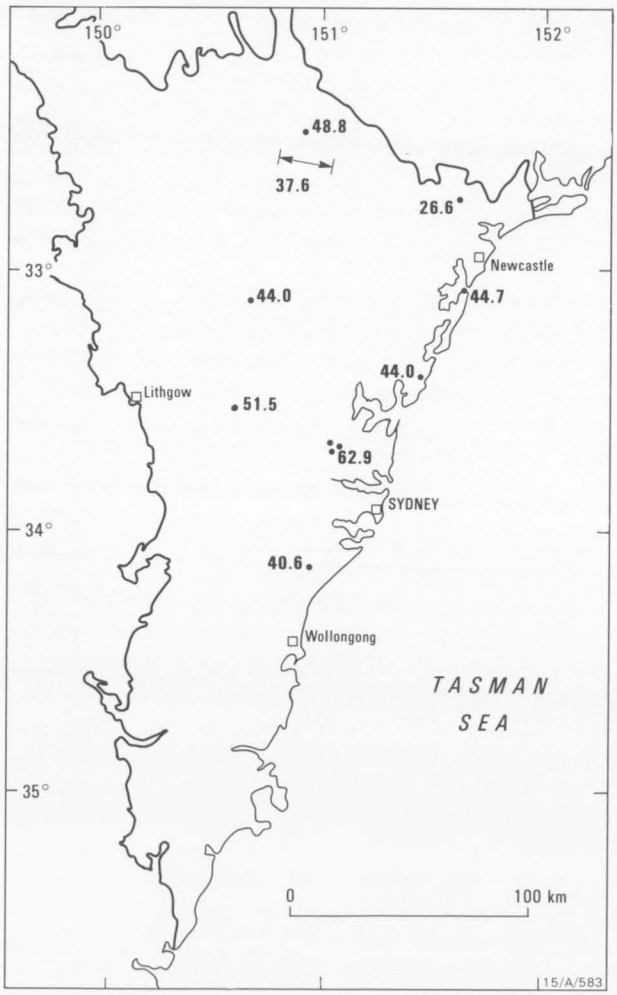

Fig. 26–3. The "effective" palaeogeothermal gradient at each of the nine Sydney Basin sites.

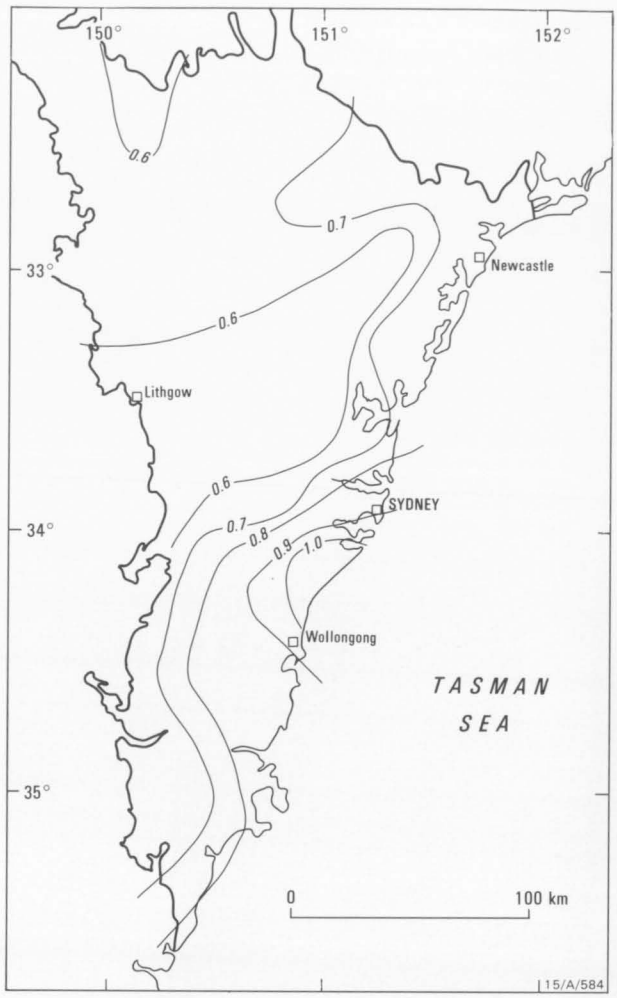

Fig. 26–4. Contours of vitrinite reflectance for the surface of the Sydney Basin.

The above procedures have been applied to the data from the Milton Monzonite and Patonga Claystone, yielding the result of a thermal pulse estimated to last several millions of years, raising the temperatures of these bodies to around 250–300°C (Fig. 26–5c). The (t_l, T_l) fields for these bodies are estimated as 5 min, 480°C and 5 min, 590°C, respectively. Specimens are usually maintained for 5 minutes after equilibration at a given temperature. Both the Milton Monzonite and Patonga Claystone are located in the coastal region of the Sydney Basin (Fig. 26–1).

The overlapped areas of Fig. 26–5c reflect the error in estimating laboratory reactivation temperatures and yield a spectrum of theoretically possible solutions, many of which can be rejected on practical grounds. For instance, the solutions with durations t of 50 Ma or more must be considered to be virtually impossible because the geomagnetic field is known to have reversed its polarity more frequently, the Cretaceous quiet zone being approximately of 30 Ma duration (Irving & Couillard, 1973). In addition, at the other extreme, a short duration ($<10^4$ years) implies temperatures in excess of 350°C, which are inordinately high, considering that a concomitant

greenschist facies regional metamorphic grade is not observed in the Sydney Basin. The midrange of values (~250°C) therefore indicates the most probable solutions using Walton's theory. More precise estimates could be achieved using a larger sample size collected specifically for the purpose of geothermometry. It is considered, however, that the present data make a very useful comparison with the reflectivity results.

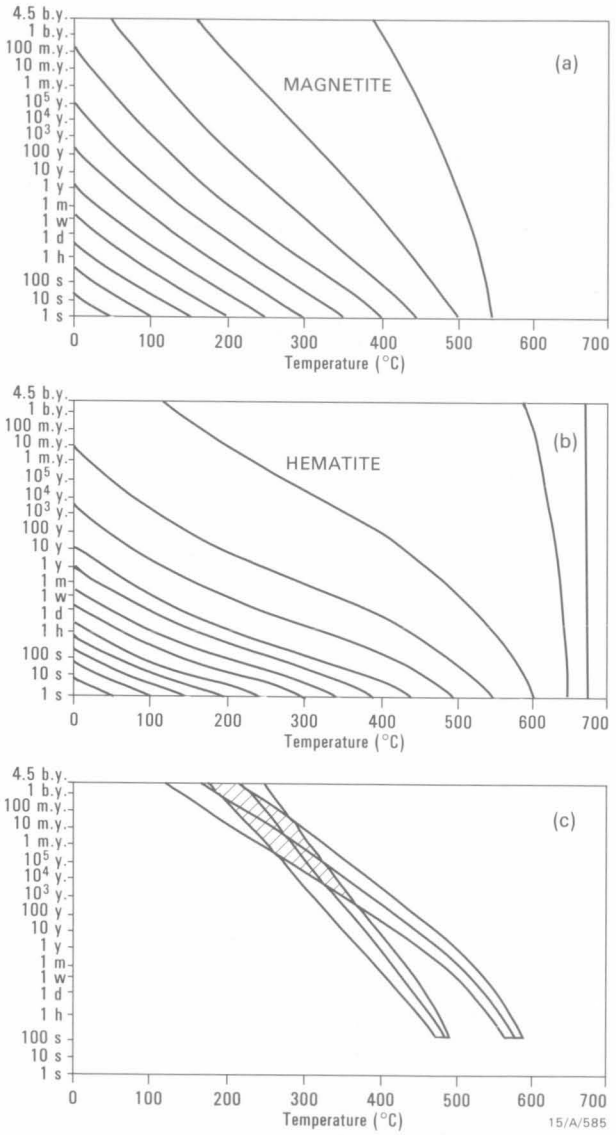

Fig. 26–5. Thermal activation diagrams following Walton (1980) for: (a) magnetite, (b) hematite and (c) rocks bearing these minerals from the Sydney Basin. The contours join time-temperature conditions of equal probability of activating a magnetic grain. Extrapolating laboratory to geological conditions, palaeotemperatures may be estimated if demagnetization data from more than one magnetic mineral are available.

Results

Estimates of the thickness of eroded sediment, h, at the nine sites calculated from (10) with the probable lower and upper limits of t_2 are given in Table 26–3. Values of G_2 and R_0 are obtained from Table 26–2, and T_o is assumed to be 15°C. The h values in Table 26–3 are essentially the depths of the present-day surface immediately prior to erosion. Also shown in the table are temperatures at the depth h immediately before the rapid erosion and ages of the surface rocks at the nine sites for comparison with eroded thicknesses. Except for Jerrys Plains 1, which is located near the culmination of a major anticline in the north of the basin, all the other sites with Permian surface rocks have lost at least 1.5 km of younger sediments. The temperatures in column A of Table 26–3 are effective palaeotemperatures of the present-day surface rocks calculated at depth h from the effective palaeogeothermal gradient G_2. They are probably considerably less than the maximum palaeotemperatures and, like G_2, represent an averaging of the temperatures experienced at the depth h prior to erosion.

Observed geothermal gradients near incipient or young rifts may be used to give estimates of temperatures which may have influenced magnetization at the depths in Table 26–3. Heat flow in the Rio Grande rift is in the range 2.1–3.6 HFU*, with values falling rapidly beyond 50 km from the rift boundary (Decker & Smithson, 1975). Erickson & others (1975) report heat flow values in the Red Sea, a newly formed active spreading centre, to be 3.5–3.6 HFU.* On the basis of these data, it is not unreasonable to assume a heat flow of 3 HFU** along the coastal region of the Sydney Basin during the early stages of Tasman Sea opening. Assuming a sediment thermal conductivity of 5×10^{-3} cal $cm^{-1}s^{-1}$ $°C^{-1}$***, the geothermal gradient immediately before erosion was about 70°C km^{-1}.

Temperatures in column B of Table 26–3 show palaeotemperatures immediately before erosion, assuming the geothermal gradient to be 70°C km^{-1}. It may be noted that these estimates are 50–100°C lower than those derived from the magnetic overprinting. This suggests that the assumed geothermal gradient of 70°C km^{-1} might be lower than the actual gradient, or that one of the assumptions made in applying Walton's model (such as a log normal grain-size distribution or even that both the Patonga Claystone and the Milton Monzonite have suffered similar thermal histories) to the magnetic overprint data, may have been violated. We should emphasize at this point that although the thermal

* 2.1–3.6 HFU = 87.86–150.62 mWm^{-2}

* 3.5–3.6 HFU = 146.44–150.62 mWm^{-2}

** 3 HFU = 125.52 mWm^{-2}

*** 5×10^{-3} cal $cm^{-1}s^{-1}$ $°C^{-1}$ = 2.1 $Wm^{-1}K^{-1}$

TABLE 26–3. THICKNESS OF ERODED SEDIMENT, h, FROM (26–10) AND THE TEMPERATURE AT THE DEPTH, h, IMMEDIATELY PRIOR TO EROSION

	t_2 = 70 Ma			t_2 = 110 Ma			
Bore/well	*h(km)*	*T(°C)* A	B	*h(km)*	*T(°C)* A	B	*Age of surface rocks*
East Maitland No. 1	3.34	104	249	3.10	97	232	middle Late Permian
Jerrys Plains No. 1	1.50	88	120	1.36	81	110	middle Late Permian
Doyles Creek bores	2.17	97	167	1.99	90	154	late Late Permian
Howes Swamp No. 1	1.06	62	89	0.92	55	79	late Early Triassic
Swansea	1.80	95	141	1.65	89	131	late Late Permian
Terrigal No. 1	1.75	92	123	1.60	85	127	late Early Triassic
Dural wells	1.16	88	96	1.06	82	89	early Middle Triassic
Illawarra bores	2.88	132	217	2.76	127	208	early Early Triassic
Kurrajong Heights No.1	0.88	60	77	0.75	54	68	late Early Triassic

Temperatures in column A are calculated from G_2 in Table 26–2, and temperatures in column B and calculated assuming a geothermal gardient of 70°C km^{-1} immediately before erosion. Eroded thicknesses and temperatures are calculated for the probable lower and upper limits of t_2. The age of surface rocks at each site is shown for comparison with eroded thickness.

activation expressions commonly in use were developed for single domain particles, it is valid to extend the expressions to cover more complex domain structures if it is understood that the v from (11) is generalized to V_{act}, the activation volume, rather than the grain volume, and if the appropriate variation of coercive force with temperature is used (Wohlfarth, 1961; Dunlop & Bina, 1977). The experimental results of Tucker & O'Reilly (1980) from multidomain titano-magnetites indicate that except for temperatures in the vicinity of the Curie point, the coercive force varies similarly to that of single domains. Although the rocks studied here may contain multidomain grains (in fact, Schmidt & Embleton, 1981, show that the Milton Monzonite does contain multidomain grains), for the temperature range of interest the single domain theory should provide a good estimate of temperature–time variables.

From the above, it is clear that upwards of 1 km of overburden has been removed from the Sydney Basin, whether one uses the reflectance data or the overprint data. A short period (5–10 Ma) with the geothermal gradient elevated 10–20°C km^{-1} greater than G_2 immediately before the erosional event will have little effect on coalification but a major effect on magnetization. The temperatures in column B of Table 26–3 indicate that the surface rocks at two of the near coastal sites are in the vicinity of 200°C.

Discussion

An important result of the present modeling of coalification in the Sydney Basin is that the exposed rocks at various localities along the coastal region may well have been elevated to temperatures of 220°C or more, as originally suggested from palaeomagnetic studies. The surface vitrinite reflectance map (Fig. 26–4) gives a relative indication of the areas of greatest erosion, as more deeply buried rocks have greater coal rank. An accurate delineation of basin-wide erosion cannot be given without good knowledge of the regional variation in effective palaeogeothermal gradient, the gradient influencing coalification as opposed to the maximum palaeogeothermal gradient immediately prior to erosion, which influences magnetization. More data is needed to define accurately the effective palaeogeothermal gradient throughout the Sydney Basin. Nevertheless, the present data indicate that a thickness of sediment of between 1 and 2 km has been regionally lost. Locally, thicknesses of up to 3 km may have been lost (East Maitland 1 and Illawarra bores).

The significance of the effective palaeogeothermal gradient G_2, as opposed to the instantaneous palaeogeothermal gradient, is that coalification depends on a long duration of heating, whereas overprint magnetizations tend to reflect elevated temperatures. For significant coal rank increase at temperatures below 350°C, the coal must be maintained at that temperature for some tens of millions of years. Figure 26–6 shows the response of vitrinite reflectance to increase of temperature which is maintained for periods of a month or less (Bostick, 1971). The instantaneous response of vitrinite reflectance is inconsistent with the long-time response (3); a unifying hypothesis of coalification does not presently exist. It is clearly seen that termperatures in excess of 350°C are required for an instantaneous (in a geological sense) response of coal rank to temperature. Therefore, the instantaneous thermal conditions are not as critical as the long-term conditions for

the determination of the degree of coalification and contingent tectonic information. To determine the depth of burial (eroded thickness h) from coalification considerations using the effective palaeogeothermal gradient G_2 and then to determine the instantaneous palaeotemperature at this depth of burial using an appropriate instantaneous palaeogeothermal gradient is not an inconsistent argument. In most areas of the Sydney Basin, except those influenced directly by local igneous activity, the maximum palaeogeothermal gradient would probably have occurred immediately before the uplift associated with the Tasman Sea spreading, when the heat flow increased to about 3 HFU*. Prior to this, the instantaneous palaeogeothermal gradient is unlikely to have exceeded G_2 significantly.

The erosional episode is modeled as instantaneous in the above analysis. If the greater part of the erosion occurred in less than 5 Ma, then the instantaneous model would be a good approximation. However, little knowledge exists of the erosion rates or the present day location of the eroded sediment. Little Tertiary sediment is preserved on the Australian continent to the west of the Sydney Basin. Variable thickness (up to 1 km) exists offshore in the Tasman Sea (Shaw, 1979); the age of these sediments is poorly known. Another alternative is that a large network of rivers fed the eroded sediment into Late Cretaceous and Tertiary sedimentary basins along the southern Australian continental margin. Thicknesses of up to 8 km of Late Cretaceous sediments have accumulated in these basins (Veevers, 1981). The assumption of a rapid erosion rate is consistent with observation and is the simplest for the purposes of the present study.

The model of coalification and the model of thermal activation of magnetization discussed in this paper clearly provide supporting evidence for elevated surface palaeotemperatures in the Sydney Basin as suggested by Schmidt & Embleton (1981). This method may provide successful corroboration of overprinting observed on other continental margins.

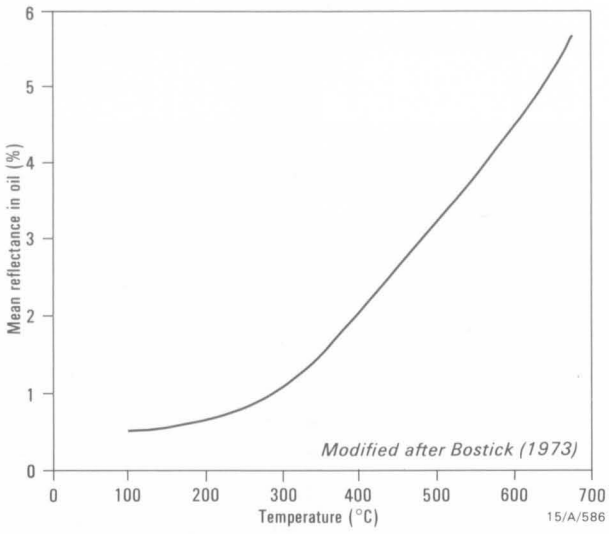

Fig. 26–6. Vitrinite reflectance versus temperature for coal and anthracite bombs maintained at a given temperature for up to a month (based on data published by Bostick, 1973).

Notation

a	constant
b	constant
B	constant
C	thermal alteration parameter
f_o	fluctuation rate
G	geothermal gradient
h	thickness
H_k	intrinsic coercivity
J_s	spontaneous magnetization
k	Boltzmann's constant
R_o	vitrinite reflectance in oil
t	time
T	temperature
v	volume
V	rate of subsidence
z	depth

Note added in proof. Evidence based on vitrinite reflectance has recently been presented (Friedman & Saunders, 1982) in support of great depth (−6.5 km) of burial near the eastern margin of the United States.

Acknowledgments. We gratefully acknowledge improvements to the manuscript suggested by W. Gale, D.A. Clark, J.J. Veevers, and B.J.J. Embleton.

* 3HFU = 125.52 mWm^{-2}

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CHAPTER 27

Tectonic History from Vitrinite Reflectance*

by
M.F. Middleton

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Introduction

The signature of the thermal and tectonic history of a sedimentary basin is preserved by the reflectance of vitrinite in coals and carbonaceous fragments in sediments within a basin. Vitrinite reflectance in oil, an index of coal rank, is an optical property measured from vitrinite in carbonaceous matter or coal within the sedimentary sequence (Hoffmann & Jenkner, 1932; Stach & others, 1975). Reflectance of vitrinite increases with increasing coalification or organic metamorphism. The reflectance of vitrinite is important as an indicator of the degree of diagenesis of organic matter and maturation of hydrocarbons (Shibaoka & others, 1973); Dow, 1977; Kantsler & others, 1978).

It has long been realized that vitrinite reflectance is a function of temperature and time. Dow (1977) suggested that the coalification reaction, as a first-order chemical reaction, varied linearly with time and exponentially with temperature. Karweil (1956), Lopatin (1971) and Bostick (1973) have proposed empirical nomograms relating the thermal history of a sedimentary sequence to coal-rank indices such as volatile matter and vitrinite reflectance. Hood & others, (1975) published a nomogram relating the level of organic metamorphism (LOM), which is empirically related to vitrinite reflectance, to effective heating time within 15°C of maximum temperature. Shibaoka & Bennett (1977) developed a nomogram based on the Lopatin (1971) assumption of a doubling of the reaction rate for each 10°C temperature increase. The various nomograms provide a method for reconstructing the thermal history of a sedimentary basin from coal-rank information.

Dow (1977) postulated a simple empirical rule relating vitrinite reflectance R_o to depth z:

$$\log(R_o) = \log(A) + mz \qquad (1)$$

where A and m are constants that depend upon the tectonic history of the sedimentary sequence from which the measurements are made. The rule suggests a linear relationship between the logarithm of vitrinite reflectance and the depth, and applies only to sedimentary sequences unaffected by major unconformities, geologically young vertical faulting and localized igneous intrusive activity. Depth versus log (R_o) data of Shibaoka & Bennett (1977) and Diessel & others (1978) support Dow's postulation. Equation (1) can be restated as:

$$R_o = A \exp(nz), \qquad (2)$$
where $n = m\log_e(10) = 2.30m$.

In this paper I shall propose a generalized temperature–time–vitrinite reflectance expression, demonstrate its consistency with Dow's rule (equation 1) and give examples of its application to vitrinite reflectance data from three Australian sedimentary basins.

Generalized Expression for Vitrinite Reflectance–Temperature–Time

The present model of coalification, entailing vitrinite reflectance, temperature and time, is based on the graphical procedure of Shibaoka & Bennett (1977), which is applicable to vitrinite reflectances of less than 2%. The nomogram of Hood & others (1975) is used to extend the reflectance nomogram of Shibaoka & Bennett beyond 2%. Table 27-1 shows the correlation of vitrinite reflectance to coal rank. The present approach is similar to that of Royden & others (1980), who relate a thermal alteration parameter to temperature and time by an equation based on Lopatin's (1971) assumption of a doubling of the reaction rate for each 10°C temperature increase.

Table 27-1. Correlation of vitrinite reflectance to coal rank based on Hood & others (1975) and Stach & others (1975).

Rank of coal	*Vitrinite reflectance (%)*
Peat-lignite	0.2–0.4
Sub-bituminous	0.4–0.6
High-volatile bituminous	0.6–1.1
Medium-volatile bituminous	1.1–1.5
Low-volatile bituminous	1.5–1.9
Semi-anthracite	1.9–2.5
Anthracite	2.5–6.0

The nomogram of Shibaoka & Bennett (1977) represents the vitrinite reflectance R_o of a coal maintained at constant temperature T_m for a given time t_1. The nomogram is described by the equation:

$$(R_o)^a = R^a + bt_1 \exp(cT_m), \qquad (3)$$

where R is the initial reflectance of vitrinite (in the peat state, approximately 0.2%), and a, b and c are constants. Shibaoka & Bennett use the nomogram to determine graphically vitrinite reflectances for time-varying thermal histories. They approximate the temperature–time history, which is known, as the average temperature for each 10 Ma interval for the total burial time of a coal-bearing stratum; R_o for the average temperature during the first 10 Ma is simply found from the nomogram. The vitrinite reflectance for subsequent 10 Ma intervals is found by maintaining the corresponding average temperature until the reflectance attained in the previous 10 Ma interval is reached, then the temperature is maintained for another 10 Ma. This

procedure represents the history of vitrinite reflectance as a zig-zag line across the nomogram (Shibaoka & Bennett, 1977, p.60, fig.6).

The above procedure is described by the integral equation:

$$(R_o)^a = R^a + b \int_0^{t_1} \exp cT(t)dt, \qquad (4)$$

where t is time, t_1 is the age of the coal stratum and T(t) is the temperature (history) of the coal as a function of time. The constants a, b and c are chosen in the present model as a=5.5, b=2.8 x 10^{-6} and c=0.065, from a combination of the nomogram of Shibaoka & Bennett (1977), and the nomogram and LOM-vitrinite reflectance correlation of Hood & others (1975). The vitrinite reflectance–temperature–time nomogram from equation (3) with these values of a, b and c is shown in Fig. 27–1.

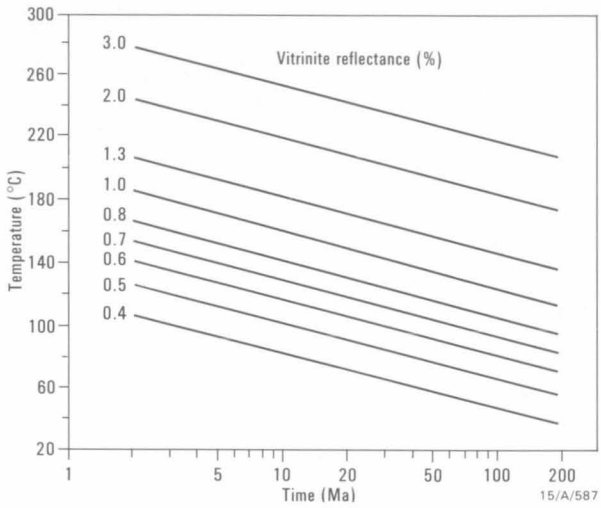

Fig. 27–1. The vitrinite reflectance–temperature–time nomogram from equation (27–3), with a = 5.5, b = 2.8 x 10^{-6} and c = 0.065. It is a combination of the Shibaoka & Bennett (1977) nomogram, with the LOM-vitrinite reflectance correlation and the LOM nomogram of Hood & others (1975).

If the subsidence history of a sedimentary basin is known, the assumption of a linear temperature distribution with depth:

$$T(t) = T_o + G(t)z_s(t), \qquad (5)$$

allows vitrinite reflectance to be expressed as a function of the time of sediment deposition *after initiation of subsidence* t_s, where T(t) is the temperature distribution as a function of this time, T_o is the surface temperature, G(t) is the geothermal gradient as a function of this time, and $z_s(t)$ is the depth of sediment deposited at time t_s as a function of this time. Vitrinite reflectance can be written from equation (4) as:

$$(R_o)^a = R^a + b \exp (cT_o) \int_{t_s}^{t_b} \exp [cG(t)z_s(t)]dt, \qquad (6)$$

where t_b is the age of the sedimentary basin. This equation is used to model vitrinite reflectance versus depth for a number of specific, sedimentary-basin tectonic histories.

Vitrinite Reflectance for Special Tectonic Models

Sedimentary basins commonly undergo the tectonic cycle of subsidence, quiescence (no tectonism), uplift and erosion. During this tectonic cycle, the geothermal gradient within the basin may not change greatly. Another common tectonic regime is the cooling continental–margin basin, which has a decreasing geothermal gradient with time. Specific expressions for vitrinite reflectance from equation (6) are presented for these two cases.

Subsidence in sedimentary basins has often been observed to follow an exponentially decreasing rate with time (Sleep, 1971) or to be proportional to the square root of the age of the basin (Turcotte & Ahern, 1977; Turcotte & McAdoo, 1979). However, in a complex depositional history, a constant subsidence rate may often suffice to approximate the subsidence history of a basin.

Erosion is assumed to occur instantaneously after an uplift episode in the following special tectonic models. This assumption gives a simpler expression for vitrinite reflectance, as a function of depth, than the assumption of some arbitrary time-varying erosion rate. Further, as the behaviour of erosional processes with time is poorly known, instantaneous removal of a layer of sediment is first-order approximation of the rapid erosion of that layer. Estimation of vitrinite reflectance from equation (6) by the instantaneous-erosion model incurs an error of approximately 3% if the real erosion rate is 1 km in 10 Ma; the error is approximately 5% if the erosion rate is 1 km in 20 Ma. The assumption of rapid erosion has little effect on the ultimate value of vitrinite reflectance.

Special tectonic histories to be considered are:

(a) Constant geothermal gradient—
  (1) subsidence at a constant rate, then no tectonism for a duration t_q, then erosion of thickness h; and
  (2) subsidence proportional to $t^{1/2}$, then no tectonism for a duration t_q, then erosion of thickness h.

(b) Decreasing geothermal gradient with time, continental margin subsidence according to the cooling model of Turcotte & Ahern (1977).

Case (a, 1): Constant Subsidence Rate–Quiescence–Erosion

The tectonic history is summarized as: constant subsidence rate v for duration t_1, geothermal gradient G; no tectonism for a duration t_q, geothermal gradient G; rapid erosion of thickness h, geothermal gradient G; and minor or no tectonism to the present day, geothermal gradient less than or equal to G.

As a general rule, the vitrinite reflectance signature is 'frozen' into the basin after the erosion period if h is greater than 500 m, G is greater than 30°C km^{-1} and the duration of burial after erosion is less than 100 Ma. The adjustment of temperatures after erosion is assumed to be instanteous; Kappelmeyer & Haenel (1974, pp. 104–107) discuss the phenomenon of temperature adjustment after erosion, which produces only a minor effect in the present model.

Equation (6) is used to obtain an expression for vitrinite reflectance as a function of depth subsequent to the erosional event. The vitrinite reflectance R_o from equation (6), with the above conditions, is given by:

$$(R_o)^a = R^a + \frac{b\ \exp(cT_o)}{cGv}\{\exp\ [cG(z+h)] - 1\} + bt_q \exp[cT_o + cG(z+h)], \quad (7)$$

where z is depth, h is eroded thickness, T_o is the surface temperature and the other parameters are as defined previously. For R_o greater than 0.3%, equation (7) is well approximated as:

$$R_o = A \exp(cGz/a), \quad (8)$$

where:

$$A = \left[\frac{b}{cGv} + bt_q\right]^{1/a} \exp(cT_o/a + cGh/a). \quad (9)$$

Equation (8) is Dow's rule (see equation 2), where n = cG/a. The exponent constant n in Dow's equation is a function of geothermal gradient G only in the present special case. The surface reflectance, A in equation (8), is a function of subsidence rate, geothermal gradient, burial duration t_q, and eroded thickness. In general, the burial duration term bt_q is greater than the subsidence term b/cGv, and is commonly an order of magnitude larger.

Case (a, 2): Subsidence Proportional to $t^{1/2}$–Quiescence–Erosion

The tectonic history is summarized as: subsidence proportional to $t^{1/2}$ for a duration t_1, geothermal gradient G; no tectonism for a duration t_q, geothermal gradient G; rapid erosion of thickness h, geothermal gradient G; and minor or no tectonism to the present day, geothermal gradient less than or equal to G.

The depth z_s to a sediment horizon deposited at a time t_s after the initiation of subsidence of the basin is given by:

$$z_s(t) = E_o(t^{1/2} - t_s^{1/2}), \quad (10)$$

where t is the duration of subsidence (t_1 in the present case) and E_o is a constant defining the magnitude of subsidence. As in the previous case, vitrinite reflectance at the time of erosion is 'frozen' into the basin.

A good approximation to vitrinite reflectance R_o, greater than 0.3%, from equation (6) with the above tectonic history is:

$$R_o = A \exp(cGz/a), \quad (11)$$

where:

$$A = \left[\frac{2b(cGE_o t_1^{1/2} - 1)}{(cGE_o)^2} + bt_q\right]^{1/a} \exp(cT_o/a + cGh/a). \quad (12)$$

Equation (11) is again a statement of Dow's rule (see equation 2), with n = cG/a.

From equations (8) and (11), it appears that for tectonic models with constant geothermal gradient G, a plot of log (R_o) versus depth is linear with a slope m given by:

$$m = (cG/a)\log_e(10) = G/194.83. \quad (13)$$

Equation (13) provides a rapid method of determining the palaeogeothermal gradient, if the assumption of a near constant geothermal gradient during deposition and pre-erosional burial can be justified. The surface reflectance is a function of a subsidence term plus a burial term, both multiplied by an erosion term. Commonly, the burial term predominates over the subsidence term.

Case (b): Subsidence by Cooling of the Lithosphere

It is generally accepted that subsidence with distance away from a mid-ocean ridge is thermally controlled (Sclater & Francheteau, 1970; Parker & Oldenberg, 1973). Rifted margin subsidence is controlled by a similar thermal mechanism (Sleep, 1971; Sleep & Snell, 1976; Turcotte & Ahern, 1977).

Turcotte & Ahern (1977) proposed a model of subsidence at a cooling continental margin that can be easily combined with the present model of coalification. Turcotte & McAdoo (1979) have successfully applied the subsidence model to predict conditions for kerogen conversion in the Los Angeles Basin.

The Turcotte & Ahern model predicts the depth $z_s(t)$ to sediments deposited at time t_s after initiation of subsidence to be:

$$z_s(t) = E_o t^{1/2} - t_s^{1/2}, \qquad (14)$$

where E_o is a constant, and t is an arbitrary time after the initiation of subsidence. The geothermal gradient G(t) in the cooling basin varies according to:

$$G(t) = gt^{-1/2}, \qquad (15)$$

where g is a constant. The constants E_o and g are functions of the temperature of the hot mantle rock under the basin, the thermal properties of the mantle and sediments, and the densities of the mantle and sediments. If T_m is the temperature of the hot mantle rock, T_o is the temperature of the Earth's surface, K_m is the thermal conductivity of the mantle, K_s is the thermal conductivity of the sediments, and k_m is the thermal diffusivity of the mantle, g can be written as:

$$g = (T_m - T_o)K_m/K_s(k_m\pi)^{1/2}. \qquad (16)$$

The temperature profile in the cooling basin is:

$$T(t) = T_o + G(t)z_s(t), \qquad (17)$$

with G(t) from equation (15) and $z_s(t)$ from equation (14).

Vitrinite reflectance is obtained from the equation:

$$(R_o)^a = R^a + b \exp(cT_o) \int_{t_s}^{t_b} \exp[cG(t)z_s(t)]dt, \qquad (18)$$

which must be integrated numerically. The expression for R_o versus depth will not follow the simple expression (2) of Dow.

Figure 27–2 shows the plot of log (R_o) versus depth for a 70 Ma old basin (t_b = 70 Ma), with E_o = 0.42 km $Ma^{-1/2}$, g = 287°C Ma Km^{-1} and T_o = 20°C. The value of g is chosen to give G = 34°Ckm^{-1} after 70 Ma. Also shown in Fig. 27–2 is the constant geothermal gradient model, case (a, 2), for G = 34°Ckm^{-1} maintained for 70 Ma from equations (11) and (12), with t_q and h equal to zero. The log (R_o) versus depth profile for the cooling basin model does not vary greatly from a straight line, although it is clearly distinct from the constant geothermal gradient model.

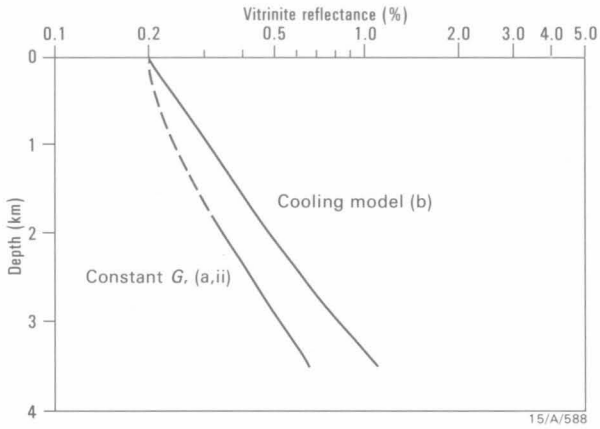

Fig. 27–2. Plots of log (R_o) versus depth for a 70 Ma-old cooling basin from equation (27–18), and a 70 Ma-old basin with a constant geothermal of 34°C km^{-1} from equations (27–11) and (27–12). The cooling basin has a greater vitrinite reflectance for a given depth.

Discussion

Vitrinite reflectance has been measured in many Australian sedimentary basins. Localized tectonic histories can be reconstructed from vitrinite reflectance versus depth data from deep exploration wells on the basis of the present model. The interpretation of reflectance data from the Sydney, Bowen–Surat and Gippsland Basins by special cases (a) and (b) is demonstrated to be consistent with the known tectonic histories of these basins.

Sydney Basin

The Sydney Basin is a Permo-Triassic basin located on the east coast of Australia (Fig. 27–3). Extensive coal-measure sediments were deposited in the basin during the Permian. Igneous activity occurred throughout the depositional history of the basin and recurred episodically to the Miocene

(Wellman & McDougall, 1974). A period of uplift and erosion, possibly associated with Tasman Sea opening between 60 and 80 Ma ago, has been suggested by various workers (Wellman & McDougall, 1974); Branagan & others, 1976; Shibaoka & others, 1973). B.J.J.Embleton (1978, private communication) has suggested a period of uplift and erosion some 100 Ma ago on the basis of palaeomagnetic overprint data. Falvey (1974) and Burke (1976) proposed uplift between 20 and 40 Ma prior to continental rifting, which is consistent with those observations of Embleton suggesting an erosional event approximately 100 Ma ago. The rate of erosion of the Middle and late Mesozoic sediments is unknown.

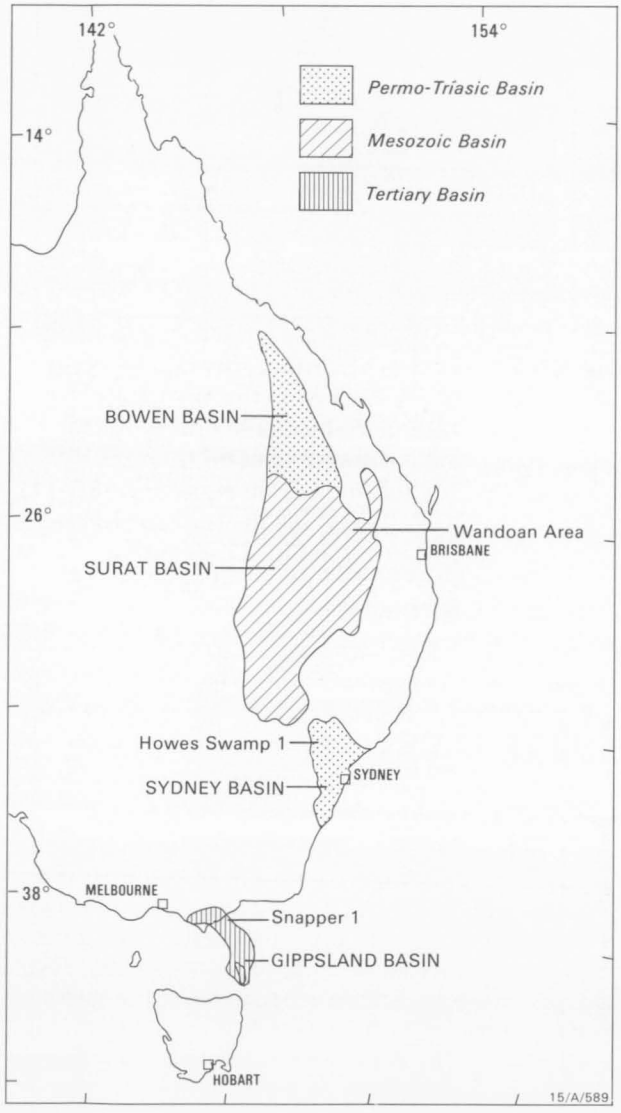

Fig. 27–3. Location map for the Sydney, Bowen–Surat and Gippsland Basins.

Vitrinite reflectance data from the Howes Swamp 1 well, located in the northern central part of the basin (Fig. 27–3), are presented in Fig. 27–4. The subsidence of the basement of the basin from Howes Swamp 1, as given by Mayne & others (1974), is shown in Fig. 27–5; a constant subsidence rate of 0.073 km Ma^{-1} approximates the observed subsidence. Tectonic models of case (a, 1), which produce the curve in Fig. 27–4, are shown in Fig. 27–6 with the subsidence of pre-Permian basement plotted against age; values of t_q and h are shown in the figure and v = 0.073 km Ma^{-1}, G = 50°C km^{-1} and t_1 = 64 Ma. Erosion is assumed to be rapid, as details of erosion in the Sydney Basin are poorly known. All three models in Fig. 27–6 produce the vitrinite reflectance versus depth curve, from equations (8) and (9), shown matched to the data in Fig. 27.4. The models are consistent with observed vitrinite reflectance data, observed basement subsidence data and the putative timing of the uplift with erosion prior to the opening of the Tasman Sea. As the thickness h of eroded sediment is unknown, the modelling cannot date exactly the uplift and erosion event.

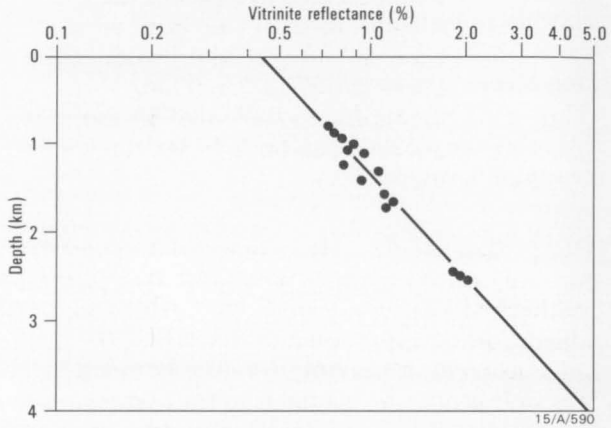

Fig. 27–4. Plot of vitrinite reflectance versus depth data from the Howes Swamp 1 well. The solid line is the curve from equations (27–8) and (27–9) produced by the tectonic histories in Fig. 27–6, with a constant geothermal gradient of 50°Ckm^{-1}.

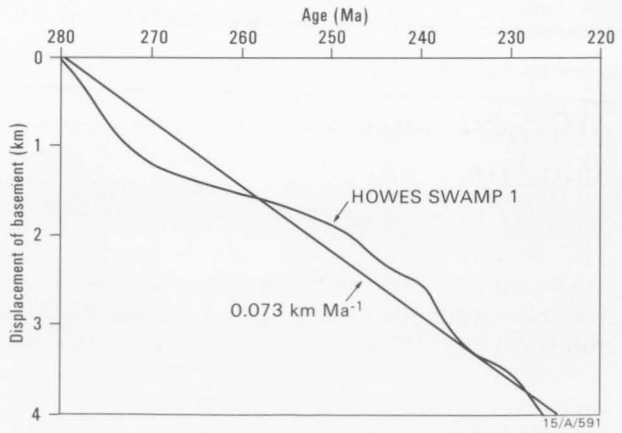

Fig. 27–5. The basement subsidence of the Howes Swamp 1 well from Mayne & others (1974); a constant subsidence rate of 0.073 km Ma^{-1} is a good approximation to the observed subsidence of basement with time.

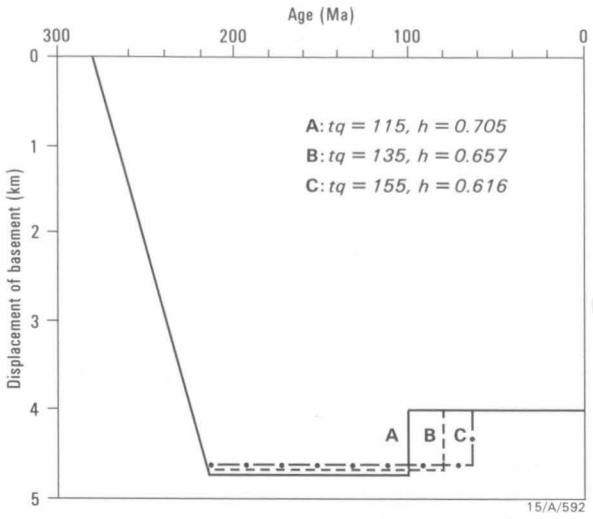

Fig. 27–6. Tectonic models for Howes Swamp 1 represented as a plot of the displacement of basement versus time. All three models produce the curve shown in Fig. 27–4. A geothermal gradient of 50°Ckm^{-1} is assumed, and t_q is in Ma and h is in km.

The present models are a first-order approximation only of the Sydney Basin tectonic history. A geothermal gradient of 50°C km^{-1}, which supports a heat flow of approximately 2.5 HFU* (heat flow units: μcal cm^{-2}s^{-1}), acting from the Permian to late Mesozoic is not unreasonable as the *average geothermal gradient*, because intermittent igneous activity during this period is well documented throughout the basin.

* Editorial footnote: (1) See comments on conversion in footnotes in chapter 26. 2.5 HFU = 105 mW m^{-2}.
(2) To compare these HFU with others, see table 4–1, p. 138 in D.L. Turcotte and G. Schubest, 1982. Geodynamics. John Wiley & Sons, 450pp.

Bowen–Surat Basins

Vitrinite reflectance versus depth data from the Wandoan region of the Bowen Basin and overlying Jurassic–Cretaceous Surat Basin (see Fig. 27–3) is shown in Fig. 27–7. The Bowen Basin, like the Sydney Basin, was formed during Permo-Triassic times.

Subsidence in the Wandoan area continued until at least 100 Ma ago (PSSA, 1964), and the subsidence of the basement well approximates a $t^{1/2}$ proportionality (see Fig. 27–8). Uplift and erosion of Cretaceous sediments was associated with seafloor spreading in the Coral Sea about 70 Ma ago (Exon & Senior, 1976; Taylor, 1976). A tectonic model is shown in Fig. 27–8, with basement subsidence versus age; also shown in Fig. 27–8 is observed basement subsidence (neglecting compaction of sediments with time) obtained from stratigraphic data (PSSA, 1964). The tectonic model is based on case (a, 2), with E_o = 0.35 km Ma$^{-1/2}$, G = 44°C km^{-1}, t_1 = 130 Ma, t_q = 50 Ma and h = 0.77 km; the model vitrinite reflectance versus depth curve, from equations (11) and (12), is shown in Fig. 27–7. The model is consistent with observed vitrinite reflectance data and tectonic information.

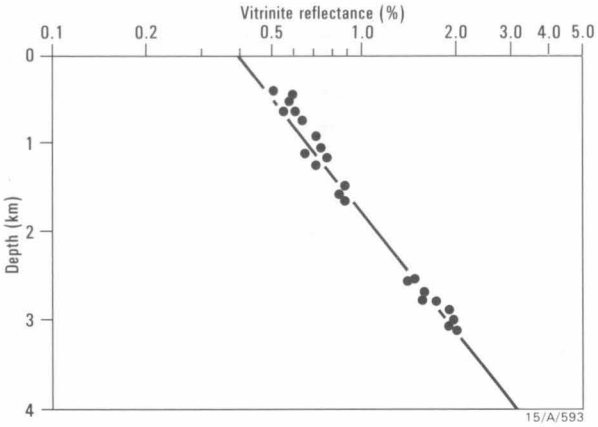

Fig. 27–7. Plot of vitrinite reflectance versus depth data from the Wandoan region (Shibaoka & others 1973). Also shown as a solid line is the model curve from equations (27–11) and (27–12) for the tectonic history proposed in Fig. 27–8, with a constant geothermal gradient of 44°Ckm^{-1}.

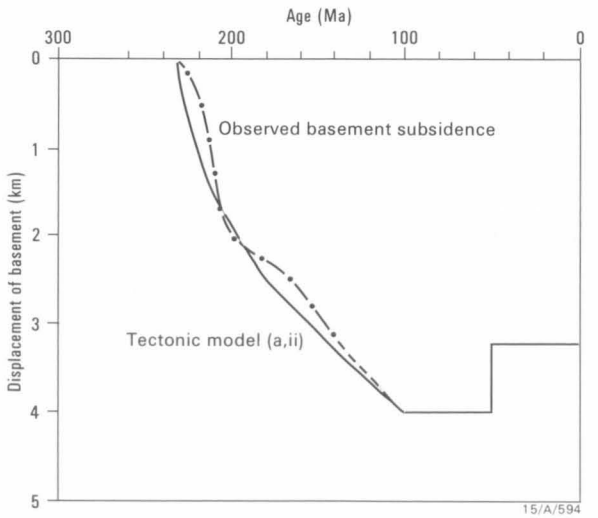

Fig. 27–8. The proposed tectonic history of the Wandoan region, represented as a plot of the displacement of basement versus time, with a constant geothermal gradient of 44°Ckm^{-1}. The observed basement subsidence, which closely follows equation (27–14), is also shown.

Gippsland Basin

The Gippsland Basin is located on the southeastern Australian continental margin (Fig. 27–3). The regional setting and geological history of the Gippsland Basin are described by Weeks & Hopkins (1967). Basin subsidence was strongly influenced by Tasman Sea seafloor spreading about 70 Ma ago (Ringis, 1975; Shaw, 1978). The formation of the basin subsequent to 70 Ma ago is essentially described by a Turcotte & Ahern (1977) cooling lithosphere model (case b).

Reflectance data, and a present-day temperature of 116°C at 3.15 km, have been published by Kantsler & others (1978) for the Snapper 1 offshore well. The present-day geothermal gradient is approximately 34°C km^{-1}, assuming a sea-bed temperature of 10°C. Figure 27–9 shows the vitrinite reflectance versus depth curve for a cooling model (case b) of a 70 Ma old constantly subsiding basin with a present-day geothermal gradient of 34°C km^{-1}. The cooling model reflectance curve is consistent with the observed reflectance data of Kantsler & others (1978); the observed and model geothermal gradients are also concordant.

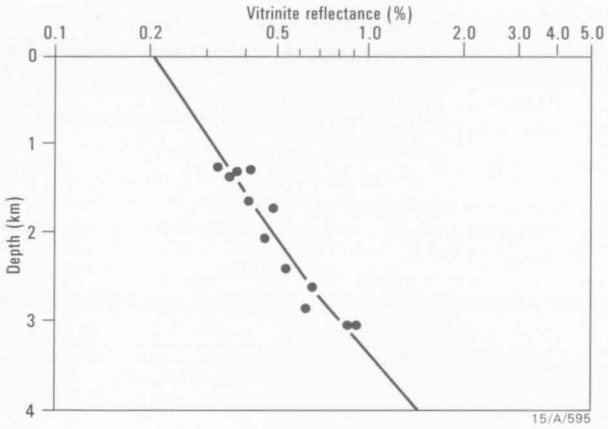

Fig. 27–9. Plot of vitrinite reflectance versus depth data from Snapper 1, Gippsland Basin (Kantsler & others, 1978). The solid line is the case (b) model of a cooling basin with a geothermal gradient of 34°Ckm^{-1} after 70 Ma (present day).

Conclusions

The present model of vitrinite reflectance behaviour with temperature and time adequately explains observed vitrinite reflectance versus depth profiles from three Australian sedimentary basins of differing tectonic histories. Further, the model is essentially consistent with the empirical rule of Dow (1977) that log (R_o) versus depth is linear for a basin with a near constant geothermal gradient during the major period of organic metamorphism.

An important generalization of the model is that the palaeogeothermal gradient G can be expressed in terms of the slope m of the log (R_o) versus depth curve, as:

$$G = 194.8m \qquad (19)$$

for basins with a constant palaeogeothermal gradient. A rapid approximate estimate of palaeoheat flow can be made from equation (19) by multiplying G by the sediment thermal conductivity (typically 5 mcal cm^{-1} s^{-1} $°C^{-1}$) (2 Wm^{-1} $°K^{-1}$).*

Special cases (a) and (b) of the present model enable palaeoheat flow, burial period and eroded thickness in a sedimentary basin to be estimated. The inherent ambiguity notwithstanding, inversion of of equation (6) provides a general method of determining essential features of the tectonic history of a sedimentary basin from vitrinite reflectance versus depth data. Such an approach provides an extra source of information for the interpretation of the tectonic history of a sedimentary basin, as well as important information on hydrocarbon maturation within the basin.

* 1 mcal cm^{-1} s^{-1} $°C^{-1}$ = 418.4/Wm^{-1} $°K^{-1}$

Acknowledgments

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CHAPTER 28

Tectonic History

by
H.J. Harrington

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Introduction

The tectonic structures of the coal basins described in the chapters in this publication are illustrated in 22 plates. Some details on the tectonic history are presented in individual chapters, and special topics, such as palaeothermometry and reflectance, are discussed in Chapters 26 and 27.

Throughout this study the basins have been described in two main groups: the marginal basins that were on or near the Permian coast of eastern Australia and the interior basins distant from the Permian coast. The tectonics of the two groups were different but related.

Marginal Basins

Previous Tectonic Theories

The Sydney, Gunnedah and Bowen Basins are marginal basins forming a continuous belt of 1750 km long between the New England–Yarrol Orogen to the east and the pre-Permian craton to the west (Fig. 28–1). Harrington (1982) listed the main tectonic theories of origin that have been proposed for this belt of basins:

(1) The belt was an exogeosyncline or foredeep to the New England Eugeosyncline (Voisey, 1959).

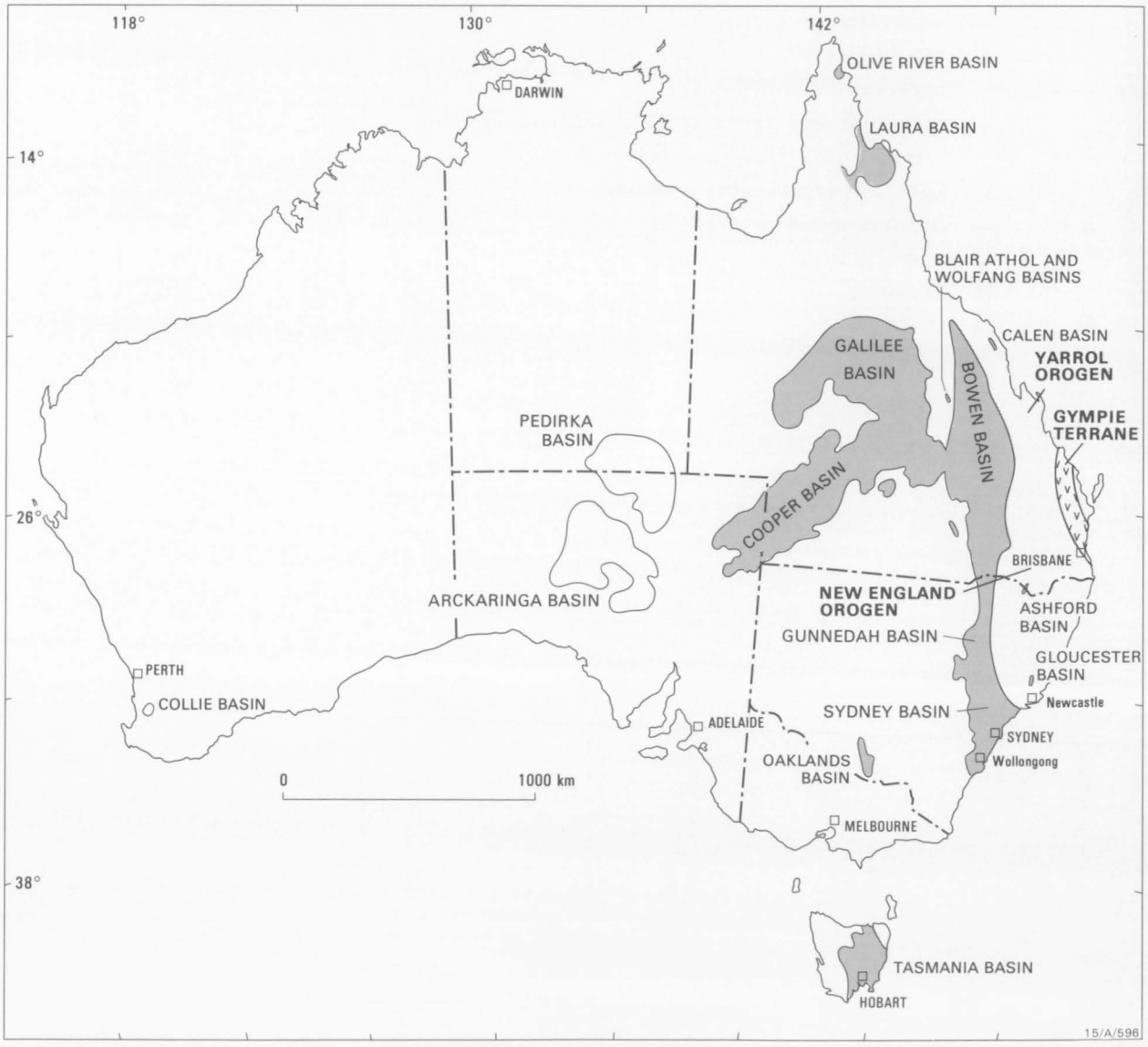

Fig. 28–1. Location of the Permian coal basins in relation to the New England–Yarrol Orogen. Tectonic events in the orogen can be correlated with the "births" of the coal basins to the west, and with stages in their "lives". Their "deaths" can be correlated with the accretion of the Gympie Terrane late in the Mid Triassic. (The Gympie Terrane was much more extensive before parts of it were removed when the Tasman and Coral Seas opened.)

(2) In the Late Permian, it was a fore-arc trough related to New England in much the same way as the Aure Trough is to the Papuan Peninsula (Jones & McDonnell, 1981). Note that this idea provides a possible modern analogue of the *Late* Permian Sydney Basin, but does not explain the origin of the basin or the *Early* Permian and pre-Permian situations. The fore-arc concept has been extended to the Triassic (Conaghan & others, 1981). It resembles Voisey's model.

(3) The overthrust theory is possibly supported by more geologists than any other, and a published formal statement of part of it has been made by Hobbs (1985). It is that the New England Orogen was thrust over the Lachlan Orogen depressing its edge and burying most of the Kuttung Volcanic Arc. Probably most adherents to the theory believe that the main thrusting occurred early in the Permian; but systematic analyses of the consequences are needed. Thrusts are visible in the longwall faces of mechanical open-pit mines in eastern parts of the Bowen Basin and larger listric thrusts, similar to those in the Appalachian coalfields are prominent on unpublished seismic traverses that have been made in recent years for petroleum exploration companies. They are characteristic of thin-skinned thrust tectonics in many parts of the world, and in the Bowen Basin dip towards its eastern margin.

(4) The basin was formed by rifting during earth expansion (Carey, 1969).

(5) It was initiated by Late Carboniferous and Early Permian volcanic rifting between the Lachlan and New England regions, but was a foredeep in the Triassic (Scheibner, 1976).

(6) It was a failed third arm of a rift system in which the other two arms widened 200 Ma later to form the Tasman Sea. Analogues of this situation exist on the southern and western coasts of Australia where continental splitting was preceded, for 100 to 200 Ma or more, by deposition in narrow precursor rift valleys and failed arms. This theory must surely have been invented several times since the concept of failed arms was postulated fourteen years ago, but again no published statement has been found.

(7) A long diapir of hot material from the asthenosphere was intruded into the crust in the Late Carboniferous. Subsidence of its eastern part in the Early Permian was accompanied by igneous activity and caused the formation and evolution of the Sydney Basin (Brownlow, 1981). This is a "thermal" theory.

(8) The basin was formed as the New England Fold Belt slid past the eastern side of the Lachlan Fold Belt by a strike-slip on the Mooki–Lapstone Fault in the Latest Carboniferous and earliest Permian (Harrington & Korsch, 1979a, b). It is a transform basin, like those in California (transforms and major strike-slip faults being the same). Basins are formed where some divergence accompanies the strike-slip, and where splay faults leave the main fault and where there is overlap of en echelon faults.

In an important recent review, Murray (1983) has strongly supported the foreland basin model, which he also terms the retroarc basin model. It is a combination of models 1 and 3 above. A retroarc basin is a variety of back-arc basin, lying between a volcanic arc and a craton.

Initiation and Youth of the Marginal Basins: Transform Rifting and Volcanism (Figs 28–2 to 28–8)

That model is accepted in large part, but it has important complexities which caused Harrington & Korsch (1979a) to modify it, proposing that the foreland basin was also a set of transform basins. The complexities arise from the location of the volcanic arc and the date of initiation of the basin. It was argued by Harrington (1982) that the basin was formed at the very end of the Carboniferous or the beginning of the Permian. The major Mooki fault system cut the Kuttung–Bulgonunna Volcanic Arc and the Kuttung Volcanic Arc became extinct and was moved by dextral strike-slip to its present position (Fig. 28–2). The fault is a basement feature at least 1750 km long, but it is exposed only in a small area east of the Gunnedah Basin (Fig. 28–2) where it was named the Mooki Fault (from the Mooki River) by Carey (1934). Elsewhere, it is covered by sedimentary or volcanic sequences from Early Permian to Quaternary in age, with some sequences draped over it monoclinally. Portions of it have been recognised and named earlier in the subsurface; for example the Goondiwindi Fault east of the south end of the Bowen Basin, and the Lapstone Basement Fault under the Lapstone Monocline in the Sydney Basin (Harrington & Brakel, 1981). As with other major strike-slip faults, parts of it can be fault zones many kilometres wide; as for example the Lapstone Basement Fault under the western coalfield of the Sydney Basin, where strands that have been rejuvenated or reactivated in post-Permian times have affected the coal measures and their cover (Shepherd & Huntington, 1981; Shepherd, & others, 1981; unpublished CSIRO Investigation Reports in Shepherd & others). The effects are comparatively minor in a regional geological sense, but they have dramatic and costly effects in the underground mines, resulting in parallel zones of weak rocks and unworkable coal up to 200 m wide,

across the coalfield (termed the "piano keyboard effect" by the writer). These zones are especially costly where they have not been predicted and mine layout has not been prepared to handle them. Reactivation of the faults has probably occurred through geological time since the Early Permian, and in historical time has probably been the cause of the Robertson, Kurrajong Heights, Picton and other earthquakes.

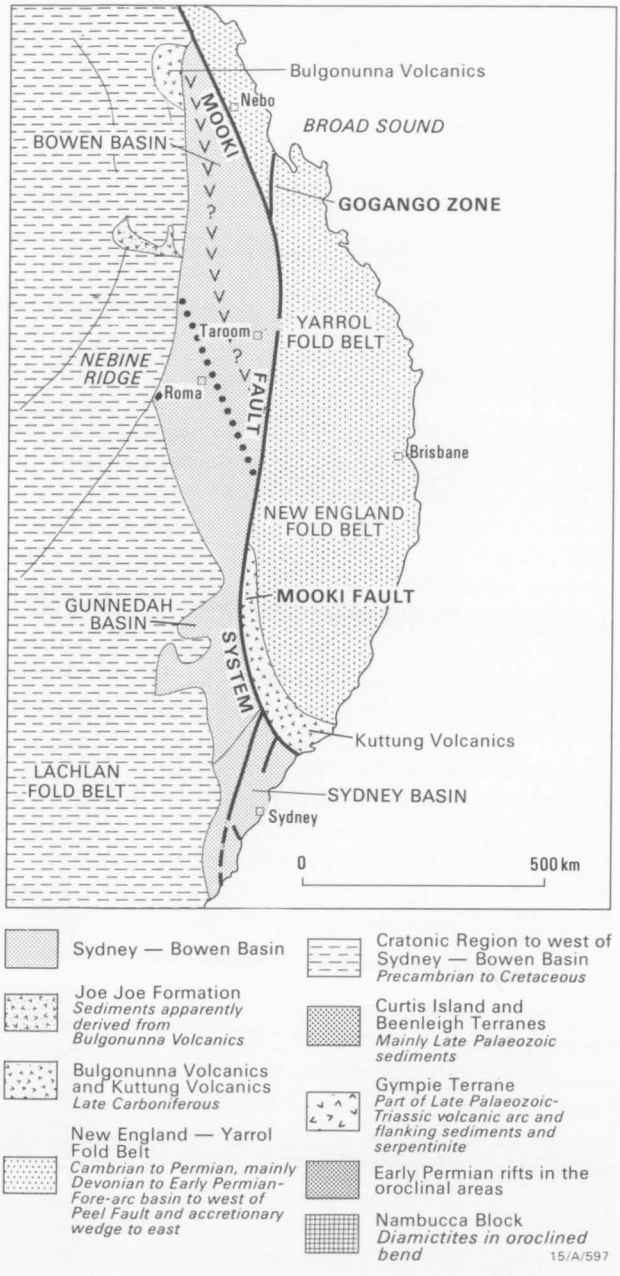

Fig. 28–2. Schematic diagram depicting evidence for possible strike-slip on the Mooki Fault System. The Bulgonunna and Kuttung volcanics have effectively the same Late Carboniferous isotopic ages and appear to have been separated by a strike-slip of between 250 and 500 km. Joe Joe Formation seems to be a northern equivalent of the Currabubula and Senham Formations of the Kuttung belt, all being tuffaceous and lithologically similar, and of Late Carboniferous age. Drillholes show that volcanics form the basement of the Bowen Basin east and north of the dotted line near Roma, especially in the Comet Ridge (part of the line of V's). This set of volcanics is inferred to be a concealed extension of the Bulgonunna Volcanics. An alternative interpretation that the Kuttung and Bulgonunna belts are continuous under the Bowen Basin is possible, but is not favoured because only sediments and not volcanics have been found in the Bowen Basin drill holes south of the dotted line near Roma. (Legend applies also to Fig. 29–2 to –10.)

Splay faults, some known, and others probably unknown at present, leave the main fault on both sides and have major and minor effects associated with them. For example, the Nepean Faults trend eastwards to Wollongong from the Lapstone Basement Fault in the Southern Coalfield of the Sydney Basin, and movements on them during sedimentation were possibly the cause of variations of thicknesses in the Permian and Triassic formations (Jakeman, 1980).

In the northern Sydney Basin, there is evidence that the strike-slip occurred on the Hunter Thrust leading to the development of the Macdonald Trough as a pull-apart basin (Figs 28–2, 3, and 4). When this project started, the Sydney Basin was regarded as a fairly simple broad sag, but as work proceeded we gradually developed the concept that it is a set of pull-apart basins and horsts. The structures north of the latitude of Sydney are from west to east: the Blue Mountains Shelf, the Macdonald Trough, the Northumberland Ridge, and an unnamed trough on its eastern side (Fig. 3–3). There are similar pull-apart basins and ridges in the Bowen Basin (Fig. 7–2). In general, the data bases in this report have been built around those structural and tectonic units.

In the north also, it has been postulated (Fig. 28–2) that a major earliest Permian basement fault zone splays from the Mooke fault and follows part of the Gogango Zone to Broad Sound. To the south of that splay zone, the Mooke Fault (sensu lato) is considered to have been dextral in the earliest Permian and to the north to have been sinistral.

Those pull-apart basins or transform basins that were west and south of the Mooki Fault and the Hunter Thrust coalesced to form the Sydney, Gunnedah and Bowen Basins. Several of them have great thicknesses of Lower Permian bimodal volcanics (which are characteristic of some rifts).

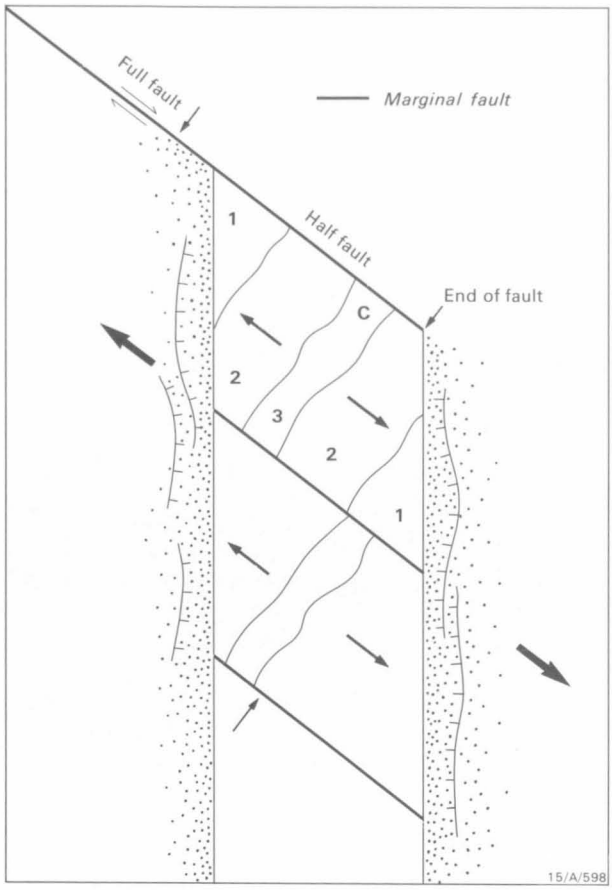

Fig. 28–3. Opening of a trough or rift by movement on a strike-slip fault (from Crowell, 1983). This model is thought to fit the Macdonald Trough in the Sydney Basin in the very early Permian, with the transform being the fault that later became the Hunter Thrust. The western side of the trough is the Lapstone Basement Fault (Harrington & Brakel, 1981), and the eastern side is the steep face formed by the Matthews Gap and Elderslie Faults and the western limb of the Lochinvar–Kulnura Anticline. For gravity data, see the next figure. It is thought that the eastern basement faults extend south from Elderslie beneath the Prospect Reservoir to Campbelltown. 1 to 3 = successive stages of rifting and therefore sedimentation. (See Fig. 28–2 for Legend.)

The Late Carboniferous volcanic arc system was replaced at the end of the Carboniferous and in the Early Permian by the strike-slip fault regime and the basins originated. They were born as transform rift basins in a foreland setting between the active New England Orogen to the east and the craton to the west. Similar rifts existed in the orogen and were mostly submarine, but the Ashford Basin east of the Peel Fault was on the exposed Campbell High and was probably a half-graben. Its western side was a fault that subsequently became the Severn Thrust. Some of the rifts, like the McDonald Trough (Figs 28–3 and 4), the Werrie Basin and the Gunnedah and Boggabri areas were partially filled by bimodeal volcanics. In Permian Fauna II time, the volcanism gave way to sediments which were predominantly marine, ending the youthful stage of basin history.

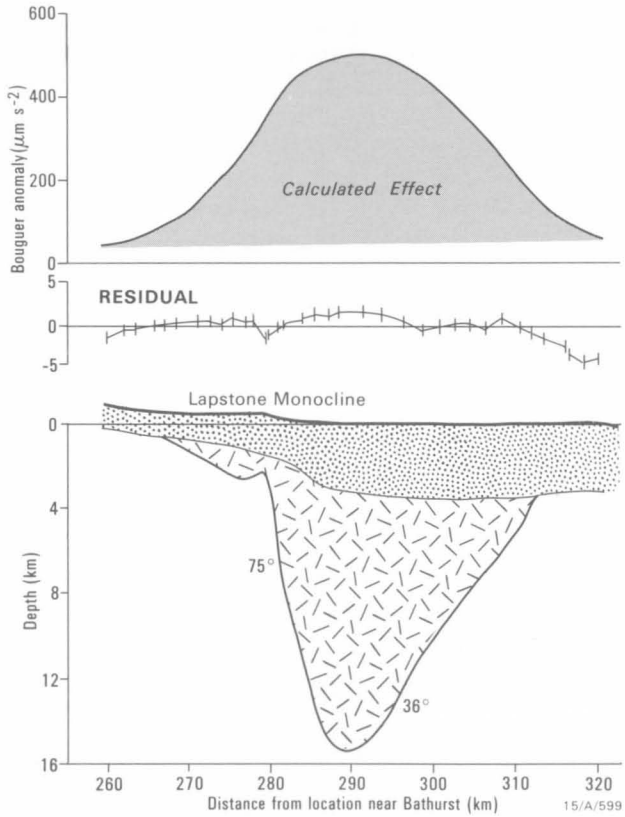

Fig. 28–4. Interpretation of the Bouguer gravity high (μms⁻²) east of the Lapstone Monocline on a line from Bathurst to Mona Vale, Sydney. A gravity low would be expected, but it is possible to explain the high if the sediments (dotted) are underlain by mafic rocks to a depth of 16 km. Note the vertical exaggeration in the geological section. The horizontal scale follows the Australian map grid (in km); see Qureshi (1984, fig. 1). The same figure provides exact location of cross-section. (See Fig. 28–2 for Legend.)

It may be noted that all transform faults must end in triple junctions at both ends (or go right round the earth so that then they would be endless). The positions and natures of the triple junctions at each end of the Mooki transform fault system are very uncertain. Harrington & Korsch (1985b, p. 171) in a paper that was written early in 1978, suggested that there were triple junctions at Bellata at the south end of the Bowen Basin and in the Nepean area where the Nepean Faults splay east towards Wollongong from the Lapstone Basement Fault (Fig. 28–2) – it was a working hypothesis only. It does not conflict with the hypothesis in Fig. 28–3, but we no longer suggest it. It was merely a working hypothesis constructed as a result of the writer's experience with active transform systems in California (San Andreas Fault) and New Zealand (Alpine Fault). The Mooki transform system is much more difficult to study than those in California and New Zealand because it is not active like them, and it is concealed beneath younger sediments except in one small area. The Mooki system has had to be studied using drilling data (see data-bases) and limited seismic data, and it will be many decades before there is any detailed knowledge of its geometry and its kinematics.

Later Stages in Basin Evolution (Figs 28–5, 28–6, 28–9 and 28–11)

(1) In the mid-Early Permian, the basin behaved as a foreland basin, being filled in part by sediments from the craton and in part from the active orogen on the east. The sediments filled the rifts and spread westwards onto the craton. The Sydney and Bowen Basins were essentially marine, but the Denison Trough was part terrestrial, part marine (Fig. 28–5). The depositional environments in this essentially marine phase in the history of the marginal basins have been described elsewhere in this report and have been summarised by Draper (1985) and Elliott (1985).

(2) In the orogen, there was a major event in the mid-Permian (Kungurian and Ufimian, approximately 258 to 268 Ma, spanning the boundary between Early and Late Permian). Oroclinal bending occurred on a grand scale east of the Peel–Yarrol Fault System (Fig. 28–6 and 28–7) causing very strong deformation of Devonian, Carboniferous and Early Permian sediments. To the west,

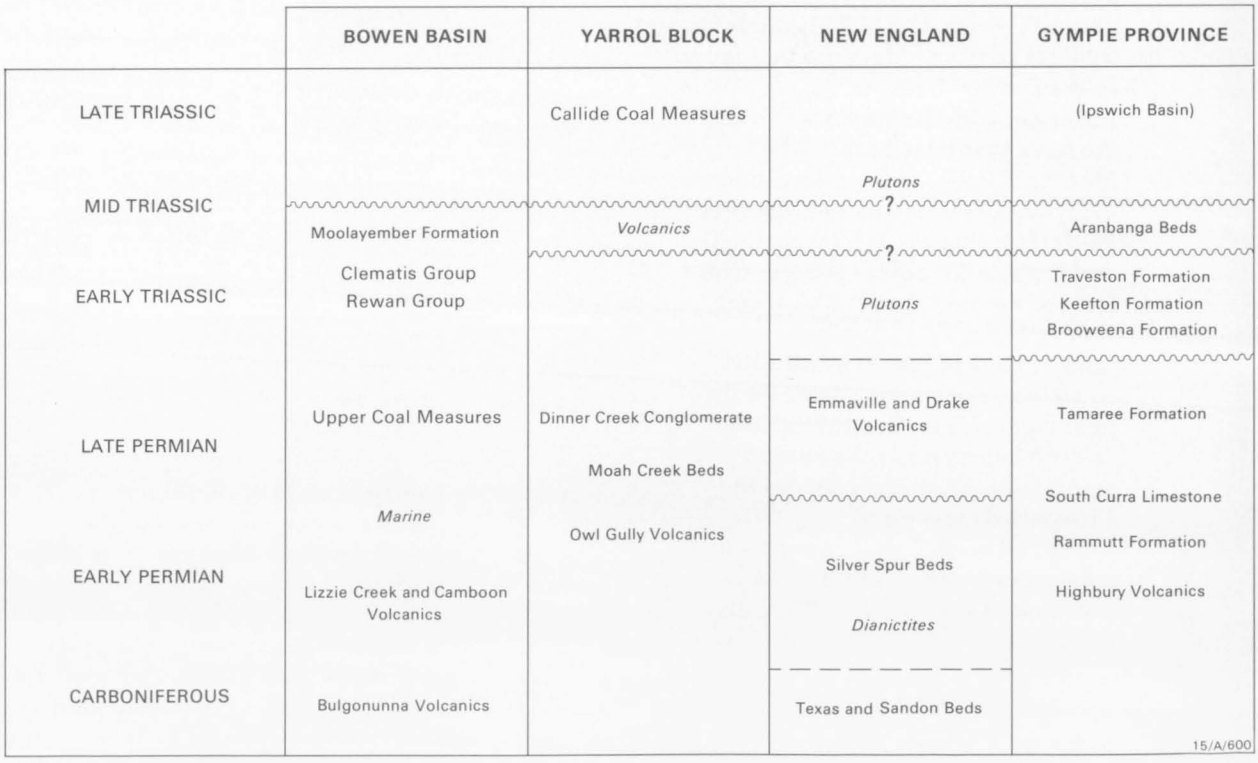

Fig. 28–5. Strong contrasts between the stratigraphies of the Bowen Basin and the terranes to the east of it. The contrasts can be explained by major strike-slip on the Mooki and Peel–Yarrol fault systems and by accretion of the Gympie Province or Terrane. (From Harrington, 1985.) (See Fig. 28–2 for Legend.)

this deformation was much less intense, so that there was some doubt about its recognition. J.J. Draper suggested (pers. comm.) that in the Bowen Basin the deformation may be represented by the break above Buffel Formation, which he considers is basin-wide. A.T. Brakel (pers. comm.) also recognised a depositonal break in many areas (but not all) at the same stratigraphic position starting late in the Artinskian and extending to the end of the Kungurian or early in the Ufimian about 258 to 268 Ma. A similar break is important in the interior Cooper and Galilee Basins below the Colinlea Sandstone. The Greta, Maules Creek, Blair Athol and Collinsville Coal Measures and their equivalents (the Middle Coal Measures) were deposited during part of that hiatus of about 10 Ma, and represent part of the response in the marginal basins to the oroclinal bending in the orogen.

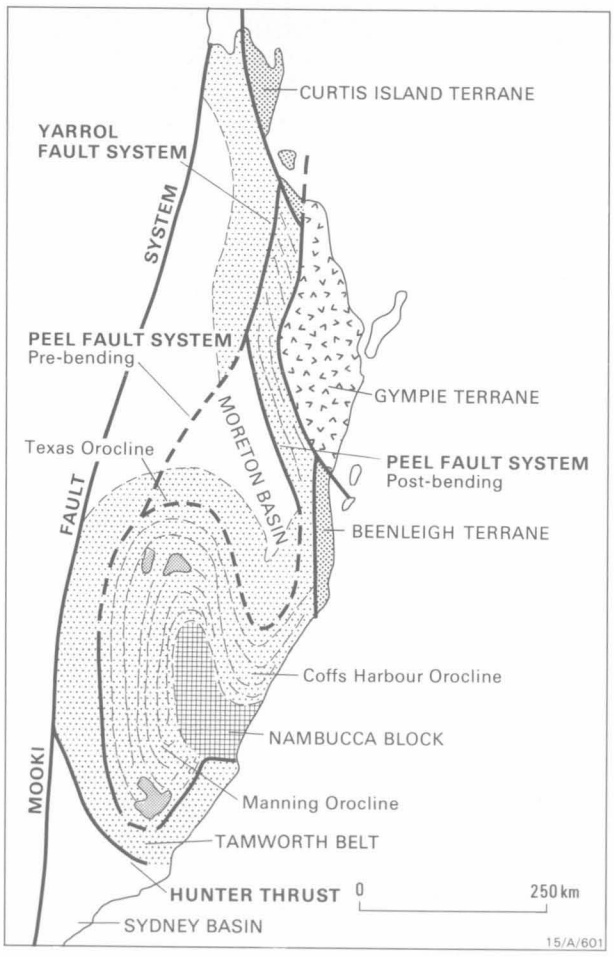

Fig. 28–6. Schematic diagram of oroclines and terranes in the New England–Yarrol Orogen. Subduction or right-oblique subduction ended at the beginning of the Permian, and was succeeded by right strike-slip on the Mooki Fault System and in the region to the east of it. The Peel–Yarrol Fault System and its associated serpentinite belt, together with the fore-arc basin to the west of it and the accretionary wedge to the east of it, were bent into oroclines during the Early Permian. The bending stopped in the mid Permian, the deformed Lower Permian being then covered by gently dipping Upper Permian. The Curtis Island Terrane and an associated serpentinite mass seem to have been emplaced also in the mid Permian by oblique strik-slip and obduction. The Beenleigh Terrane is thin-skinned, overlies a hidden layered terrane, and might be a portion of the oroclinal belt that was moved for only about 200 km, at an unknown time. Perhaps its movement occurred at the Permian–Triassic boundary when there was a change from coal measures to redbeds in the Bowen Basin and other basins. The Gympie Terrane is a portion of an exotic island arc system and seems to have been accreted to the orogen towards the end of the Mid Triassic. At that time, the coal basins were all deformed and terminated, possibly because of the accretion event. (See Fig. 28–2 for Legend.)

(3) The oroclinal bending ended in the Ufimian, very early in the Late Permian. The main period of accumulation of coal measures then commenced. At the same time, marine depositon continued in the deeper portions of the basins, gradually disappearing until coal measures were being formed everywhere in the marginal basins (and in the interior basins). The upper coal measures, which are so extensive and important, were in fact deposited in an interval of only 10 Ma, from about 255 to 245 Ma, and predominantly in the second half of that time. The quantity of hydrocarbons that accumulated was enormous, but it has not yet been calculated. Climate was very important in allowing the accumulation, but it is suspected that volcanism was involved too because there is a close association between the coals and numerous tuff beds. Perhaps the plants were provided with nutrients by the tuffs. In the New England–Yarrol Orocline, large plutons were being intruded at the same time and there was extensive felsic volcanism in the New England Orogen, some of it marine, but most of it continental (Harrington & Korsch, 1985a). A large percentage of the sediment in the Upper Coal Measures is volcanogenic. In the Gunnedah and Bowen Basins, the pyroclastics were derived from the orogen, but to the east of the Sydney Basin there was another source in the Northumberland Ridge (Chapter 3). This eastern source was close enough for forests at Newcastle (Diessel & others, 1985) and south of Newcastle, to be devastated, being levelled by explosive eruptions so that their trunks are subparallel in the

sediments. (These eruptions would have been similar to the recent eruption at Mt St.Helens in the U.S.A.) The volcanics in the Northumberland Ridge are located today mainly offshore, but are exposed onshore as the Late Permian Gerringong Volcanics, south of Wollongong. The author and others have done considerable amount of work to determine the tectonics of the Northumberland Ridge, but the only working hypothesis is that the feature might have formed as a line of volcanoes in a rift subparallel to the other rifts or troughs in the Sydney Basin. The problem might be solved by future seismic traverses. The ridge was the source of much of the volcanogenic sediment in both the Newcastle Coal Measures and in the overlying Triassic sediments in the coastal portion of the Sydney Basin.

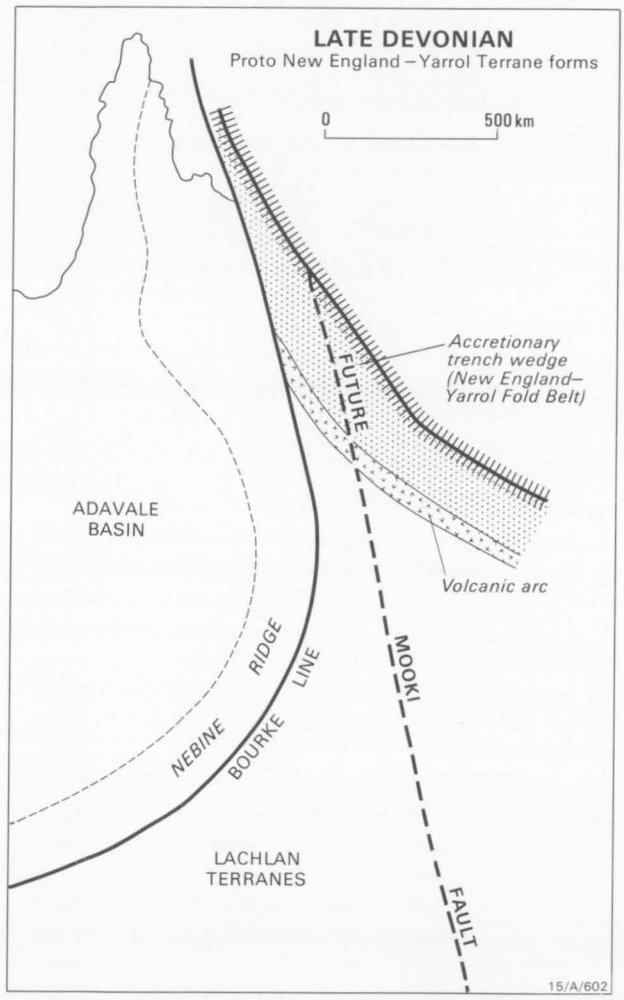

Fig. 28–7. The New England–Yarrol Orogen in the Late Devonian (and Early Carboniferous) was north of its present position. Judging from the position of the Bulgonunna Volcanics (Fig. 28–2), the orogen might have been east of Mackay and Townsville, and east of Cape York Peninsula in the Late Carboniferous. (See Fig. 28–2 for Legend.)

(4) At the end of the Permian, or a little later, there was a rapid change to the non-coal-bearing Early and Middle Triassic sequences, such as Narrabeen Group and Rewan Group and the sediments that overlie them. Clearly, a change in climate took place, probably because of continental drift. There is also a stratigraphic break more pronounced in some localities than in others. The likely cause of that break was the movement along the orogen, by strike-slip, of either the Curtis Island Terrane, or the Beenleigh Terrane, or both (Figs 28–8 and 9). It is not known whether these were originally one connected terrane or two separate terranes, but it is certain that they arrived before the Late Triassic. (For example, the Beenleigh Terrane is covered unconformably by the Late Permian Ipswich Basin.) It is possible, therefore, that the great change early in the Triassic was related to movement of one or both of these terranes.

(5) The evolution of the basin in its middle age was marked by the sequence of tectonic events (1) to (4) above; that is by rift-filling, followed by major oroclinal bending in the orogen to the east, and then by strike-slip movement of the Curtis Island and Beenleigh Terranes. No subduction effects have been recognised in the orogen during that time, so the basins are foreland basins but not of the back-arc type. The Mooki, Peel–Yarrol and more easterly faults all behaved in sequence as transforms, all of which must have ended in triple junctions to the north and south, but they were beyond the area considered here and nothing is known about them.

Basin Terminating Event (Figs. 28–10 and 28–11)

The marginal basins of Permian and Early Triassic age (and the interior basins) did not gradually decline into old age. They "died suddenly in middle age". All the sequences in all the basins terminate at the Moolayember Formation (or its equivalents), which extends into the middle of the Ladinian age, that is almost to the boundary between Middle and Late Triassic (about 231 to 235 Ma). At that time, the basins were deformed and eroded. In the marginal basins that are being discussed, and in the major interior basins, erosion continued through the Late Triassic for about 20 Ma until the earliest Jurassic when the Great Artesian Basin sequence (Eromanga and Surat Basins) began to be deposited. (However, farther east there was deposition in the Late Triassic of the Ipswich, Tarong and Callide Basins.)

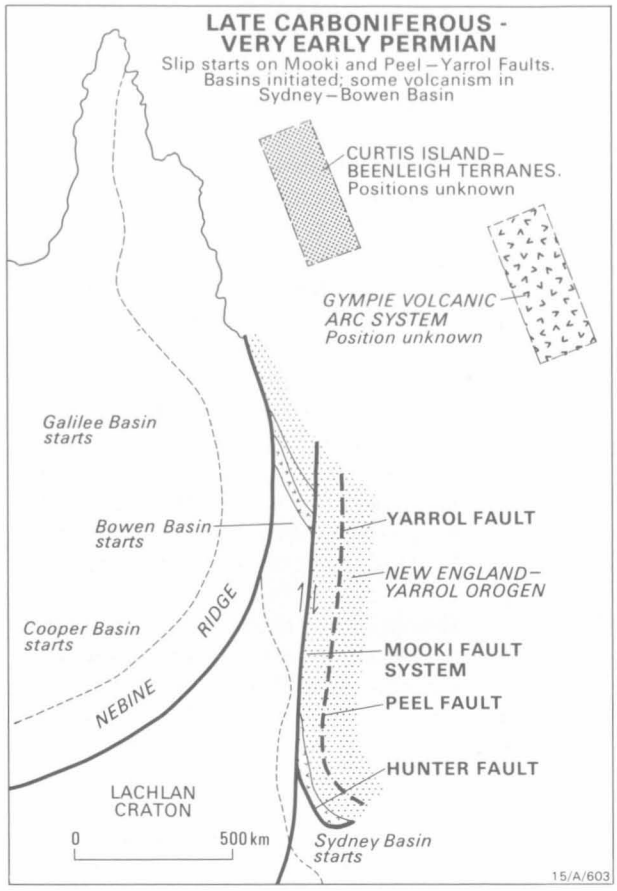

Fig. 28–8. **Births of the coal basins. The Mooki Fault system (and other faults) cut the New England–Yarrol Orogen at the end of the Carboniferous and beginning of the Permian about 280–290 Ma. The Peel–Yarrol Fault System with its associated serpentinite belt already separated a fore-arc basin on the west from an accretionary wedge on the east. In the south, the Sydney and Gunnedah Basins and the Gloucester Trough were initiated as transform pull-apart basins in which bimodal volcanics were erupted. In the accretionary wedge of the New England Orogen, there were similar rifts which filled with diamictites and felsic volcanics. The Cooper and Galilee Basins, and the Denison Trough and other troughs on the western side of the Bowen Basin, were formed. On the eastern side of the Bowen Basin, the regime was possibly still convergent because the Lizzie Creek Volcanics and Camboon Andesite are possibly arc-related and not rift-related. (See Fig. 28–2 for Legend.)**

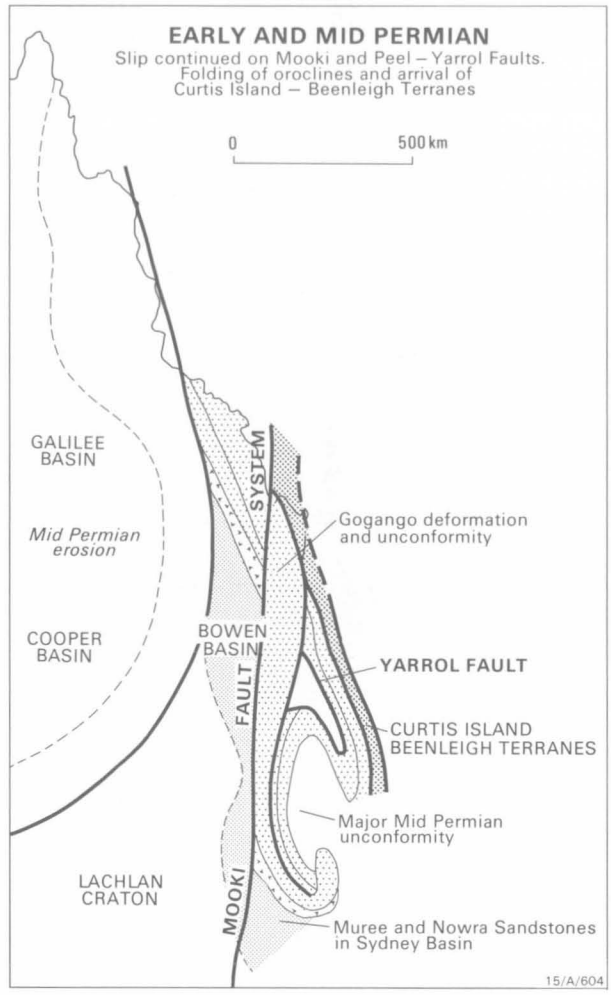

Fig. 28–9. **Schematic diagram: in the Sydney–Bowen Basin volcanism ended early in the Permian and was succeeded by mainly marine sediments which spread quietly in and beyond the initial rifts. By contrast, the accretionary wedge to the east, and part of the fore-arc basin were being bent into oroclines. The end of this interval is marked in the orogen by a widespread unconformity of Mid Permian or early Late Permian age. It extends to the interior basins where some erosion occurred. This event might have been caused by the arrival of the Curtis Island Terrane and possibly the Beenleigh Terrace by strike-slip. From about that time the Sydney–Bowen Basin became non-marine, and in the late Permian the upper coal measures were deposited over an enormous area in all basins. By contrast there was major plutonism and volcanism in the orogen. (See Fig. 28–2 for Legend.)**

A major question is: "What caused the basin-terminating event in the Middle Triassic." An answer seems to be provided by the concepts of terrane analysis that have been published and widely accepted since about 1980 (Howell & others, 1984; Howell, 1985; Leitch, 1985). They have been applied to the Sydney Basin (Harrington, 1985) and to the New England–Yarrol Orogen (Harrington & Korsch, 1985a; Korsch & Harrington, 1985). The stratigraphies in the Bowen Basin, and some of the lithostratigraphic terranes to the east of it, are shown in Fig. 28–5. All of them are very different.

The Gympie *Province* consists of the Gympie *Terrane* and its younger covering basins (Figs. 28–10 and 28-11). This Permian and Early Triassic terrane (Harrington, 1983a) consists of part of an island arc and its fore-arc basin. It is separated from the remainder of the Yarrol Orogen to the west by the Widgee serpentinite belt. The evidence suggests that it arrived at its present positon in the late Middle Triassic. It may have been an oceanic island arc that was accreted to the Yarrol Orogen by collision following the consumption of a marginal sea. After docking and accretion it might have moved by strike-slip along the Widgee suture and serpentinite belt.

There are still many unknowns, but the movement and accretion of the Gympie Terrane in the Middle Triassic seems to have been a major event (Harrington & Korsch, 1985a), which can be dated within fairly close limits between about 240 and 235 Ma (Anisian and Ladinian). This accurate dating is possible because the youngest rock unit in the terrane, the shelly Brooweena Formation, is Early Triassic and was probably deposited before accretion. The Widgee suture and serpentinite belt are crossed by a stitching pluton, the Station Creek Adamellite, which has an isotopic age of 236–231 Ma (Day & others, 1983). Moreoever, the terrane is covered at its southern end by the Late Triassic Ipswich Basin which commenced in the Carnian.

The final accretion of the Gympie Terrane can be correlated with the termination of the Sydney–Bowen marginal basin (and the Cooper, Galilee, Arckaringa and Pedirka interior basins). It seems that the accretion of the Gympie Terrane was associated with the compressive deformation and destruction of major sedimentary basins for over 1300 km into the continent from the suture.

The destruction occurred about 10 Ma after the deposition of the upper coal measures in the Late Permian, 20 Ma after the middle coal measures, and 45 Ma after the basins were formed.

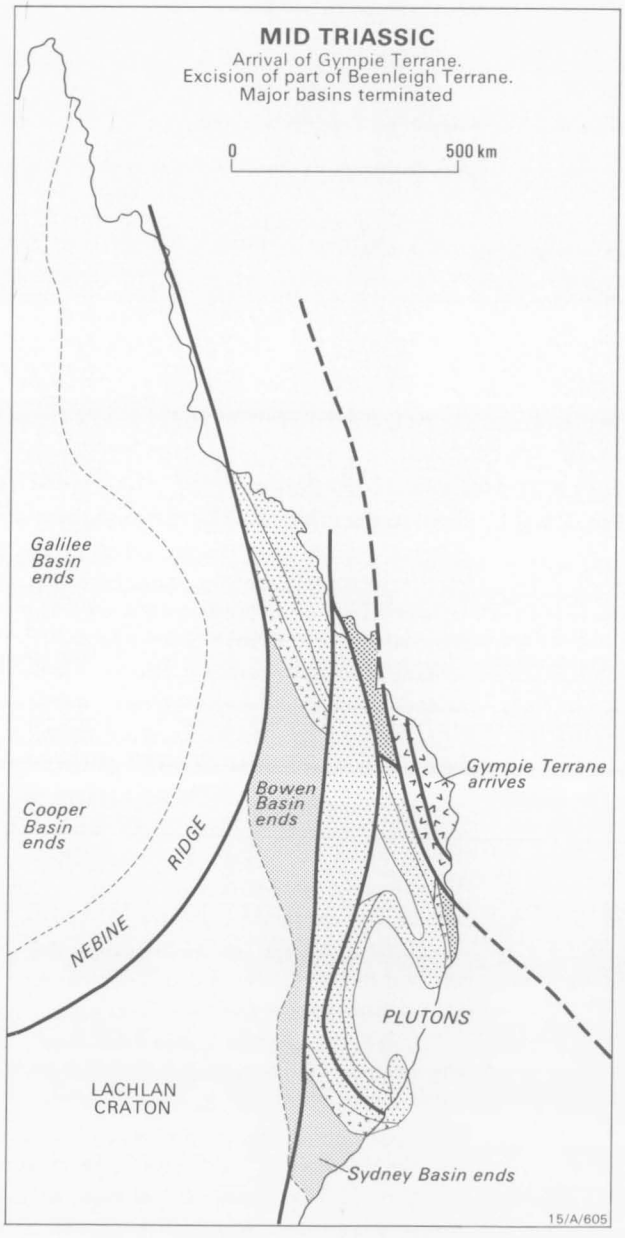

Fig. 28–10. Termination of the coal basins. Coal formation stopped at the end of the Permian, but other deposition continued until the end of the Mid Triassic (Late Ladinian, about 231–236 Ma). All the basins were then terminated, at the same time, by mild deformation, and by uplift and erosion that continued for about 15 million years until late in the Triassic. A new "Great Artesian Basin cycle" then commenced with the Surat Basin covering the Bowen Basin and the Eromanga Basin covering the Cooper and Galilee Basins. The Nebine Ridge was a very long-lived source of sediments and was not covered until the Cretaceous. The very important Mid Triassic deformation can be correlated with the arrival of the Gympie Terrane of exotic Permian and Lower Triassic rocks that are completely different from those in the Sydney-Bowen Basin and in the oroclinal region. (See Fig. 28–2 for Legend.)

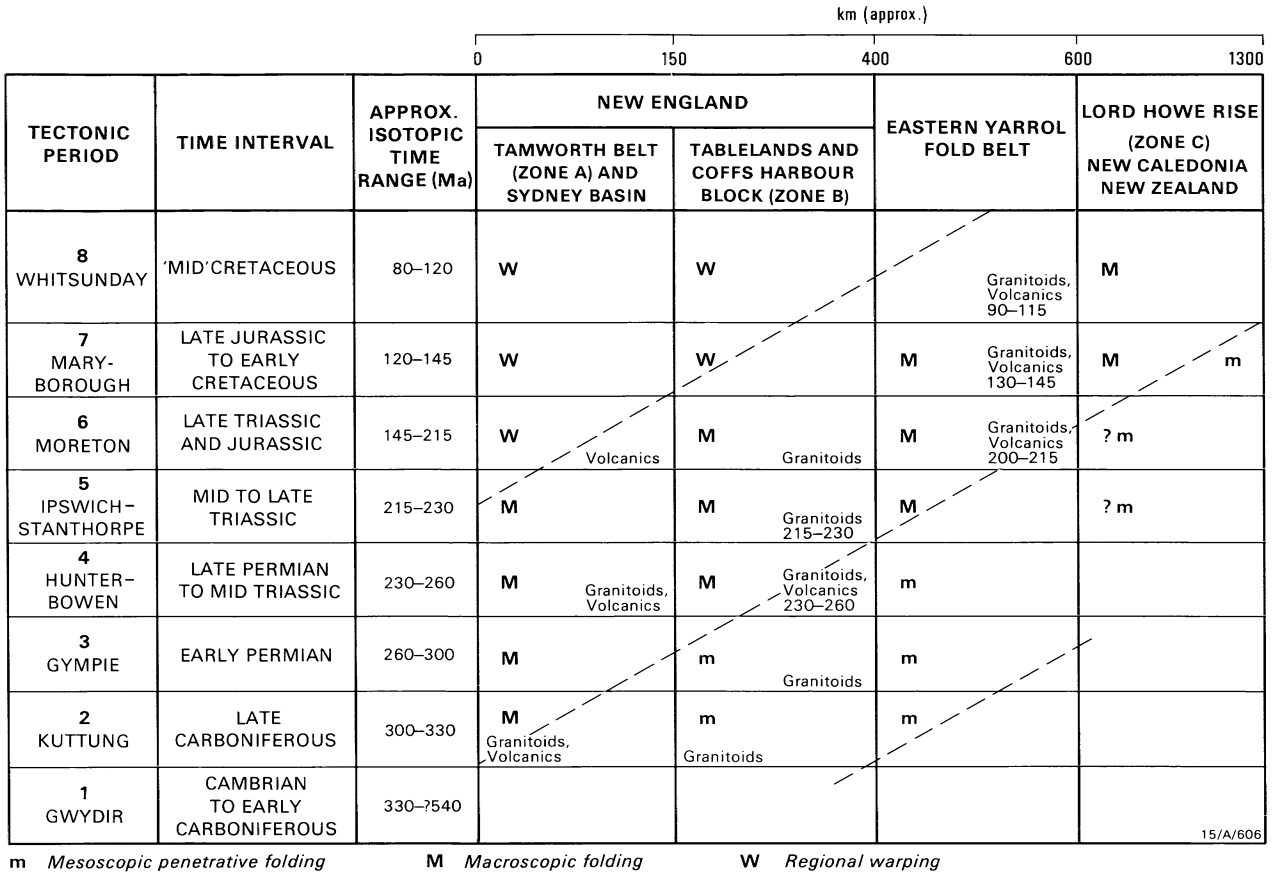

Fig. 28–11. The eastward and northeastward progression of folding and igneous events in the New England Orogen that can be correlated with events in the Sydney–Bowen and Eromanga Basins. M : mesoscopic penetrative folding; M : macroscopic folding; W : regional warping; Gr., Volcs. : granitoids, volcanics.

By the time the destruction took place, coalification was completed and the coals were at their present-day rank as shown by drillholes that have penetrated thrusts under which the coal rank decreases. (See the theoretical and practical discussion of coal rank in Chapters 26 and 27.)

Interior Basins

The smaller interior basins are graben and half-grabens that seem to have formed early in the Permian, at the same time as the marginal basins, possibly in the same way and in response to the same large-scale plate movements (i.e., movements that included the development of the Mooki Fault System sensu lato).

The larger interior basins are those under the Eromanga Basin, and especially the Cooper and Galilee Basins which have been discussed in Chapters 10 and 11, included in the data bases, and illustrated in Plates 1 to 5, 17 to 22 and other more general plates, especially Plates 31 and 34.

When this study was started, the Eromanga Basin and its infrabasins were regarded as a comparatively simple stack of sediments, but from time to time we were asked to give lectures and seminars and it was emphasised that the apparent simplicity is misleading. The overall basin is in fact a stack of troughs and saucer-like depressions which together have a "steer's head form", with a maximum thickness of 5 to 7 km, and which have had a long series of stages in their evolution, and big changes in directions of folding and faulting. It was recognised and emphasised, as a result of the NERDDC study, that the Eromanga Basin and its infrabasins were very similar in many ways to the North Sea Basin in stratigraphy, structure, size, and economic resources. This helped to justify much greater expenditure by petroleum explorers in the Eromanga Basin (Figs 28–14, 16 and 17). In an interval of 2 or 3 years, many more people began to work on these problems, some for academic interest, and some to develop ideas applicable in oil and gas exploration. While our team was working, another BMR team managed by J. Moss of the Explosion Seismology Group, was completing several thousands of kilometres of

traverses over part of the Eromanga Basin in southwest Queensland (24° to 29°S, 141° to 147°E). Both geologists and geophysicists gained from discussions. Towards the end of our work, University groups also entered the field using the data-bases and the seismic traverses. The tectonic work is in a changing developmental phase, quite different from that reached in the study of the marginal basins.

The main events that are recognised in the interior basins are set out in Table 28–1.

Thomas Chamberlain (1897) in his publication on the Scientific Method, convinced scientists that data collecting is valuable (and interesting) only if it generates multiple working hypotheses to explain them. Using this philosophy, there are now six main sets of hypotheses to explain different parts of the long geological history as tabulated above. The concepts were discussed in a seminar given in Canberra in 1982 to the Australian Society of Exploration Geophysicists, triggering a considerable amount of analysis of seismic and drilling data by BMR and industry geologists and geophysicists:

(1) One hypothesis that is unpublished but popular, because it seems so natural, is that the 7 km thick sediments in the Eromanga Basin and its infrabasins are simply underlain by a down-warped and down-faulted Precambrian basement that is presumed to be an eastward extension of the Isa and Arunta terranes and the basal parts of the Amadeus Basin. One problem with this concept is that BMR seismic profiles by Mathur, Moss and others seem to show that the crust under the basins has a signature very different from that of the Precambrian craton to the west, and that the craton crust is thicker. It is thicker even though many kilometres of it seem to have been eroded to expose high-grade metamorphic rocks. This is a simple fact but an important one that is not easy to explain; underplating would meet density problems, unless light rocks are underplated. Extension would expose the high-grade metamorphic rocks but would make the crust thinner.

(2) A second hypothesis for the initial origin of the basins (Figs 28–12 and 28–13) in the late Proterozoic or Early Cambrian is that a portion of the Precambrian craton was broken off and moved eastwards to form the Nebine Arc (Harrington, 1974). The rifted edge of the craton was at the gravity anomaly along the Diamantina River. Between that rift and the Nebine Arc, there was a marginal sea that has since been infilled, deformed several times, and then covered by the Eromanga Basin.

TABLE 28–1. MAIN TECTONIC EVENTS OF THE INTERIOR BASINS OF EASTERN AUSTRALIA

Event No.	*Time*	*Basin or rock unit*	*Structural event*
17	Late Cretaceous and Cainozoic	Lake Eyre Basin	Faults reactivated, warping, erosion
16	Mid Cretaceous	Eromanga Basin terminated	Broad warping
15	Early Jurassic	Eromanga Basin (*sensu stricto*) initiated	Sagging and broad uplift (Nebine Ridge)
14	Late Triassic		Non-deposition and erosion
13	Mid Triassic	Cooper and Galilee Basins terminated	Deformation (basins terminated)
12	Early Triassic		Depositional change
11	'Mid Permian'		Non-deposition
10	Early Permian and latest Carboniferous	Cooper and Galilee Basins initiated	
9	Late Carboniferous	Joe Joe Group	
8	Mid Carboniferous		Deformation (coeval with Alice Springs Orogeny)
7	Early Carboniferous and Late Devonian	Drummond Basin and upper part of Adavale Basin	
6	Mid Devonian		Deformation (Pertnjara Movement, approx. Tabberabberan)
5	Early Devonian	Lower part of Adavale Basin	
4	Silurian		Deformation (Rodingan Movement)
3	Ordovician		Deformation (approx. Benambran)
2	Ordovician and Cambrian	Warburton Basin (and "Thomson Orogen")	
1	Precambrian	No information. No drillholes to basement in central basin	Probable deformations

Fig. 28–12. Hypothesis (repeat, hypothesis) for the *initial* formation of the Eromanga Basin and its infrabasins in the Late Proterozoic and Early Cambrian. The basin was modified through the Palaeozoic and Mesozoic by a dozen stages of deposition, folding and rifting, so that it now consists of the stack of basins listed in the text. The sequence of modifying events was rather like the series of events in the North Sea Basin over the same time interval. The North Sea and Eromanga basins are similar in size. The Nebine Arc and Eromanga Basin can also be compared in size, and in other ways, with Japan and the Japan Sea. The Tasman Orogen developed in region C from the Late Proterozoic to the Cretaceous. (Modified after Harrington, 1974.) (See also next figure for river patterns.)

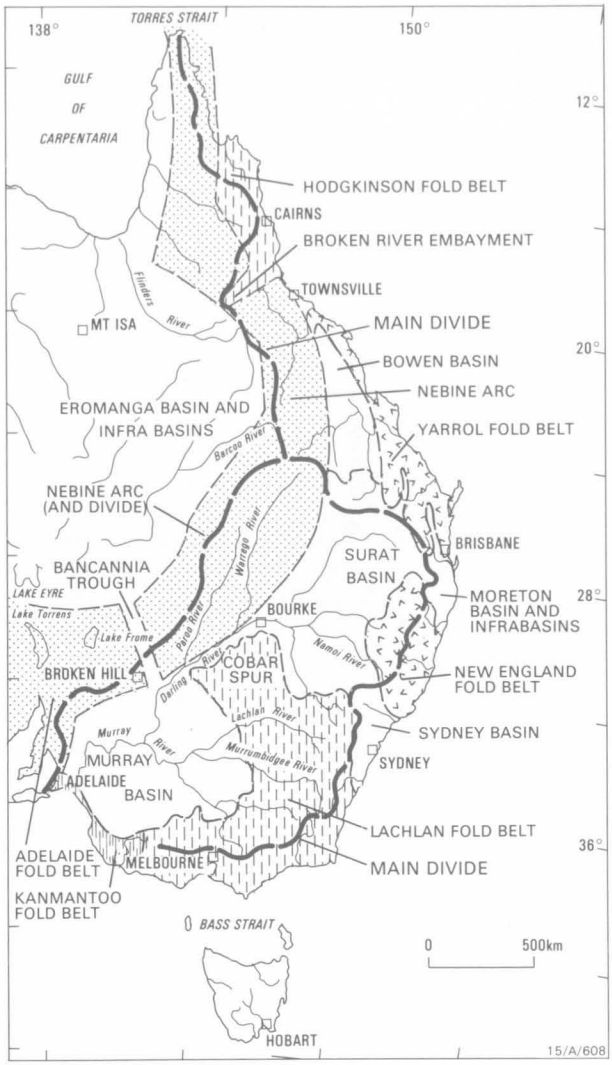

Fig. 28–13. The relationship between river patterns, the Nebine Ridge and other large-scale structures. In the north, the Burdekin and Fitzroy river systems start on the Nebine Arc and cross the exposed section of the Bowen Basin and the Yarrol Orogen to the sea. The Barcoo and Thomson systems flow southwest from the Nebine Arc or Ridge. The Darling system drains the New England Orogen, the Surat Basin and part of the Nebine Arc. The Murray River drains the Lachlan Orogen and the Murray Basin.

The Eromanga Basin and the supposed Nebine Arc are similar in size to the Japan Sea and Japan, and other similarities, allowing comparisons of geophysical data from the Eromanga and Japanese regions. The Nebine Arc does seem to be a real feature recognizable on published sections and structure-contour maps, on the digital terrain model (DTM) of Australia (Harrington & others, 1982) and on drainage maps (Fig. 28–13). It separates the Cooper and Adavale Basins from the Bowen Basin. Whether it started as a rifted continental island arc is still to be solved. It is covered only by thin Jurassic and Cretaceous sediments between the Broken Hill region and the Anakie High, and its existence has been proved by seismic traverses and especially by very numerous water bores.

(3) A third hypothesis, which is closely allied to the second one, suggests that instead of rifting there was stretching and thinning of the basement crust over a width of 400 km between the Diamantina River and the Nebine Arc. Present crustal thicknesses are 55 km in the craton and about 35 km below the basins, which might suggest a thinning of about 30%. Thinning concepts of that kind are at present in high fashion overseas, especially for the

North Sea, the Aegean Sea, and other regions like the Michigan Basin. They allow the construction of possible thermal histories, which lead on to maturation studies and decisions about expensive drilling. Consequently, there is a big and growing literature about them. Seismic data and drilling data are not yet sufficient to test this model.

(4) The fourth hypothesis advocates that the Eromanga Basin and the Anakie High are underlain by the Thomson Fold Belt of Cambrian to Early Carboniferous age (Day & others, 1983). This northeast-trending fold belt is considered to be quite distinct from the north-trending Lachlan Fold Belt, the northwest-trending Yarrol Fold Belt, the east-trending Amadeus Basin, and the northwest-trending structures in the Toko Syncline section of the Georgina Basin. The hypothesis of the Thomson Fold Belt has been widely accepted, particularly in State Geological Surveys. Certainly Early Palaeozoic rocks, both volcanic and sedimentary, have been cored from the bottoms of petroleum wells in the Eromanga Basin, but they could be used to explain any of the concepts mentioned in this chapter. Strangely also, the Early Palaeozoic rocks found in the wells are not yet recognised on seismic profiles. Therefore, we do not know whether they are either thin or extend deep enough into the crust to support the concept of the Thomson Fold Belt.

(5) A fifth hypothesis (previously unpublished) proposes that the Eromanga Basin was initially related to dextral slip on a major shear zone extending northeast from Lake Eyre along the Diamantina River line to the Cork and Wetherby structures and the Burdekin Fault. This and the first concept have some features in common.

(6) Thermal models for basins have been popular overseas because they have been successful in explaining sinking of the ocean floors as they move away from the mid-ocean ridges. The sixth concept, therefore, is based on the proposal that the temperature of the Eromanga region was somehow raised, and that the region then cooled and sank by thermal contraction (like an abyssal plain). This idea raises problems of timing and thermal decay rates. In this regard, one should note that the Cooper Basin (and the Nebine Ridge) are presently unusually hot.

These six working hypotheses apply mainly to the initiation and very early history of the overall Eromanga Basin and its infrabasins in the Late Proterozoic and Early Palaeozoic. It is not easy to choose between them because there are so few reliable data for the deeper levels of the basin, and some data have not as yet been released by petroleum companies. Several new concepts are likely to be generated by researchers involved at present in "mathematical modeling" of the basin for higher-degree theses.

From the Silurian onwards, it is possible to correlate deformational events in the overall basin with events in the shield either to the west or the orogens to the east, as shown above in tabular form.

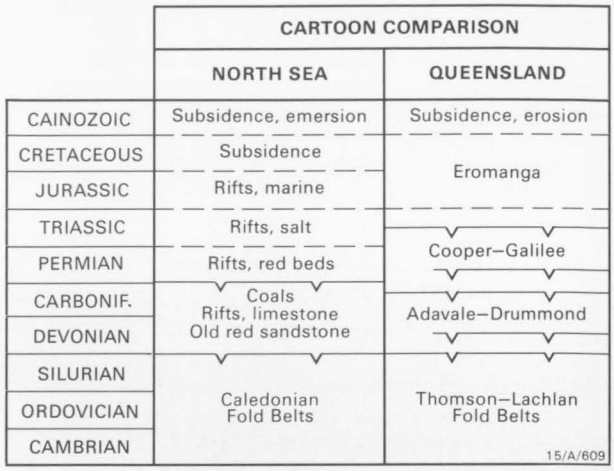

Fig. 28–14. Schematic comparison of the North Sea Basin with the Eromanga Basin and its infrabasins. The similarities of scale, history and economic resources are useful in exploration thinking. One difference, caused by palaeoclimates and palaeolatitudes, is that the main coals are Carboniferous in the North Sea and Permian in Australia. (From Harrington, 1983c).

The Early Permian phase 10 in the table represents a rifting event that formed the Cooper, Galilee, Pedirka and Arckaringa Basins. That event correlates with the main strike-slip movement on the Mooki Fault System, and with rifting over a huge region including the Sydney–Bowen basin system and rifts farther east that are filled with diamictite. The Cooper Basin, and other basins at that time, were not unlike some of the rifts that exist at the present day in some other continents (Fig. 28–15).

Late Early Permian or 'Mid' Permian non-deposition (event 11) can be correlated with the strike-slip on the Peel–Yarrol Fault System and the associated oroclinal bending in the New England–Yarrol Orogen.

An Early Triassic break (event 12) marks the change from coal measures to non-coal-bearing sequences and correlates with a similar event in the marginal basins. It might have been caused by a terrane movement in the orogen, such as the arrival of the Curtis Island or Beenleigh Terranes.

The Cooper, Galilee, Pedirka and Arckaringa Basins did not sink and grow gradually as would be expected by those who advocate the theory that rifting leads to elevated temperatures, that cooling is accompanied by thermal sinking and deposition, and then is followed by broad isostatic sinking.

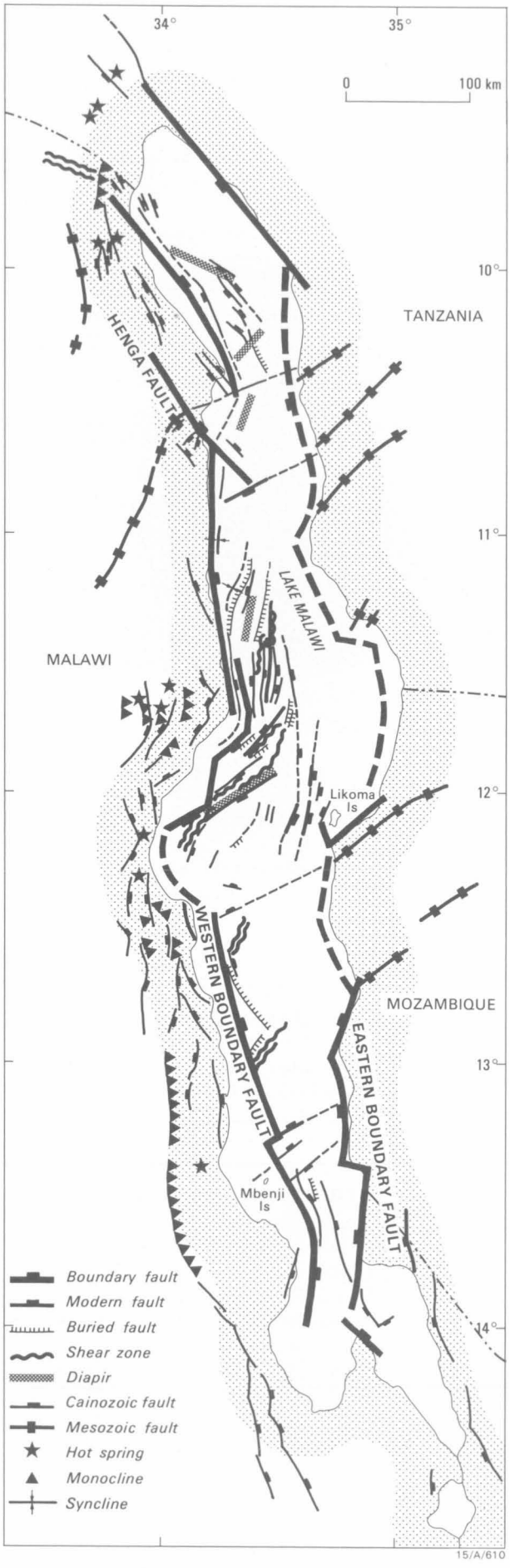

Fig. 28–15. Plan of geologic structures in the Lake Malawi rift, a possible analogue of the Cooper Basin. (From *Episodes*, 1983.)

According to those concepts, the Cooper and associated rift systems would grade fairly smoothly into the broad Eromanga Basin. However, they are not gradational. The Cooper and Galilee Basins were compressed and terminated quite suddenly in the Mid-Triassic, and that ending correlates with the termination of the Sydney–Bowen Basin late in the Ladinian. As discussed earlier, those terminating phases seem to correlate with the docking and strike-slip movement of the island arc system that now forms the Gympie Terrane.

For an interval of no less than 10 Ma, and no more than about 20 Ma, erosion and non-deposition prevailed. Presumably no depocentre existed. The thermal-decay models that are fashionable at present just do not seem to work in that interval, at least not in a simple form.

However, broad regional sagging did commence in the Eromanga and Surat Basins very late in the Triassic or early in the Jurassic. In the Surat Basin there was initial volcanism (Garrawilla Volcanics and widespread diatremes). The sagging and the volcanism could be related to an event in the lithosphere, the nature of which is unknown. The Eromanga and Surat Basins eventually coalesced covering the central part of the Nebine Arc (Fig. 28–12) presumably because it also began to sink later in the Jurassic. At that time, and particularly during a marine invasion in the Cretaceous, the Eromanga Basin was similar to the present-day North Sea Basin in size, structure and history. The data of the North Sea Basin assists in unravelling the Eromanga Basin and its infrabasins. Conversely, French geologists have consulted the writer about the Eromanga Basin, stating that the information gained has helped them in their studies of the North Sea Basin. By the Cenomanian, the Eromanga Basin was like a giant saucer-shaped depression with sediments (see Figs. 28–14 to 28–16, and 28–17).

That phase also came to an abrupt end when the Tasman Sea began to open at about the beginning of the Late Cretaceous. Half of the Tasman Orogen was removed from the continent. The Eromanga Basin sensu stricto was relatively uplifted, warped and eroded until the present day.

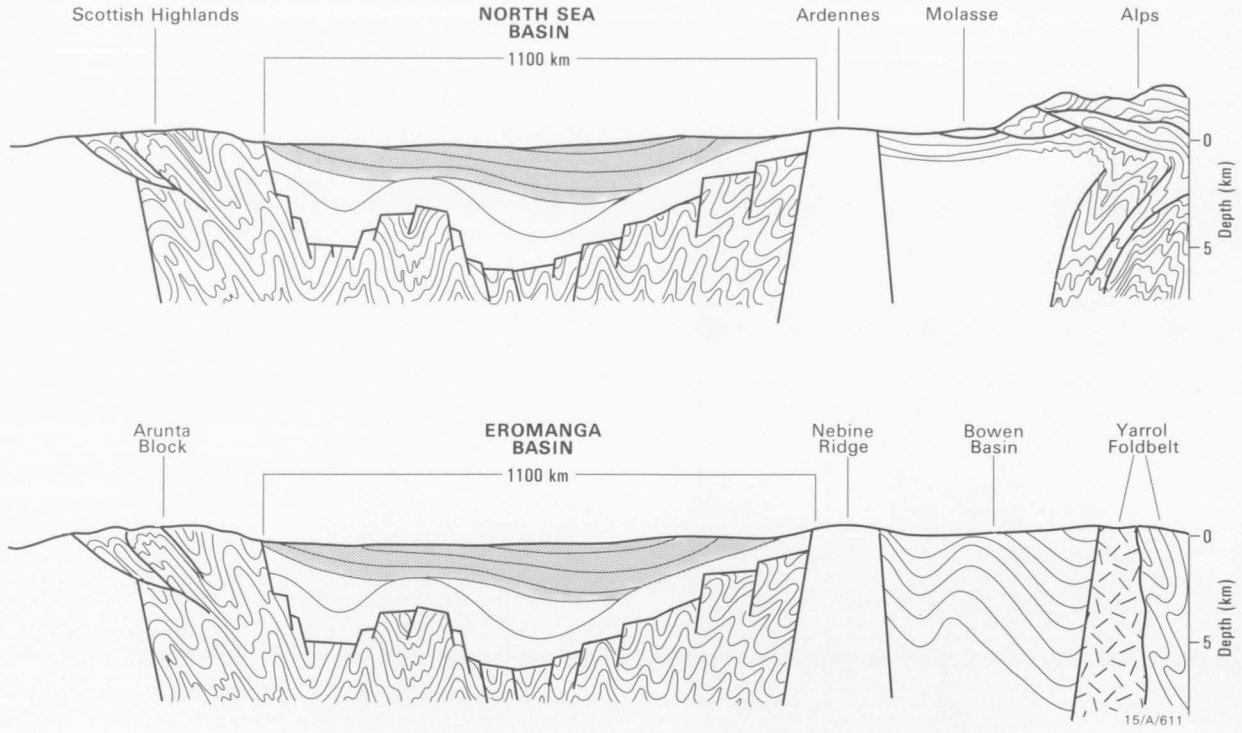

Fig. 28–16. Schematic sections comparing the North Sea and Eromanga Basins.

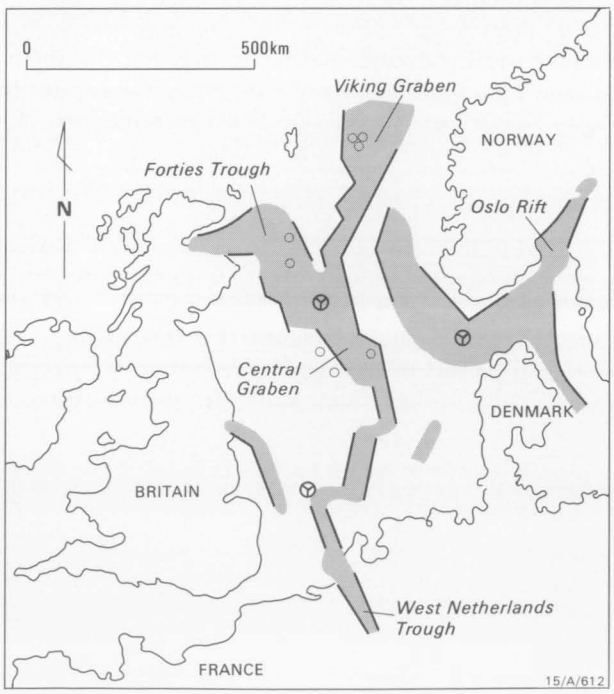

Fig. 28–17. Rifts in the North Sea Basin. They are analogues of the Cooper Basin and other former rifts under the Eromanga Basin. Published work on them is useful in understanding the Australian features. The North Sea rifts affect the Carboniferous coal measures that extends eastwards from Wales, northern and central England and central Scotland to Poland and the Soviet Union. The European coal measures occur through about the same area as those in eastern Australia. The circles mark oil and gas fields, and circles with radii mark triple junctions.

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CHAPTER 29

Thermal Effects of Intrusions on Coal

by
M.F. Middleton

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Introduction

The three most easterly Permian basins (i.e., Sydney, Bowen and Gunnedah Basins) have been extensively intruded with only minor intrusions in the other basins (e.g., Galilee and Cooper Basins). The Sydney Basin sediments were invaded by a very large volume of igneous material during Mesozoic times, and to a lesser extent during the Tertiary. Lists of some of these intrusions have been compiled by Mayne & others (1974) and Hamilton (1980), and diatremes in the Sydney Basin have been described by Crawford & others (1980). The Collinsville region of the Bowen Basin has also been extensively intruded (Mengel, 1975; Staines & Koppe, 1979), and igneous sills are commonly encountered in deep bores in other locations in the basin (Besston, 1978). Intrusives are frequently intersected in coal bores in the Gunnedah Basin (e.g., Bohena 1 and Wondobah 1; Russell, 1981; and Russell & Middleton, 1981).

Little igneous activity has been reported from the Galilee and Cooper Basins. Proximity to the eastern margin appears to be a governing factor in the presence of intrusive bodies.

A limited study has been carried out to determine the effects of igneous intrusives upon coal rank. Vitrinite reflectance was measured at locations near intrusives in both coal workings and deep exploration bores. Reflectance of a coal dyke from the Moura Mine was also measured. It is known that sub-bituminous and high-volatile bituminous coals cinder when in contact with hot magma, whereas higher rank coals tend to coke. Depending on the physical conditions of intrusion, coal sometimes becomes plastic and flows. Most of the cases studied below are examples of thermal alteration with little flow of the coal, with the exception, of course, of the coal dyke. Reflectance data measured for the study of the effect of igneous bodies on coal are tabulated in CSIRO Data-Base 1–Part 1.

Experimental Results

Huntley Colliery–HW DDH No.2

The Wongawilli and Tongarra Coals, which are mined at Huntley Colliery about 10 km south of Wollongong in the Sydney Basin, are intruded by numerous sills and dykes. More than 24 km^2 of "silling" occurs within the Permian strata of the colliery holdings. Figure 29–1 shows lithologies of a cored section of the HW DDH No. 2 borehole and measured average vitrinite reflectance of samples taken at the indicated depths. The reflectance of the Bulli Coal, typically 1.0% (Cook & Wilson, 1969) in the vicinity of Huntley Colliery, has been altered to values of 2.88% and greater. The 15.2 m-thick igneous sill immediately below the seam has caused the increase of rank. The Wongawilli Coal shows a decrease of reflectance with depth, which contravenes Hilt's Law of increasing rank with depth. This rank decrease is caused by sills above the Wongawilli Coal altering the top of the seam. Thus, the rank increase is a localized effect caused by the thermal metamorphism of the top of the Wongawilli Coal, while the base of the seam is unaffected.

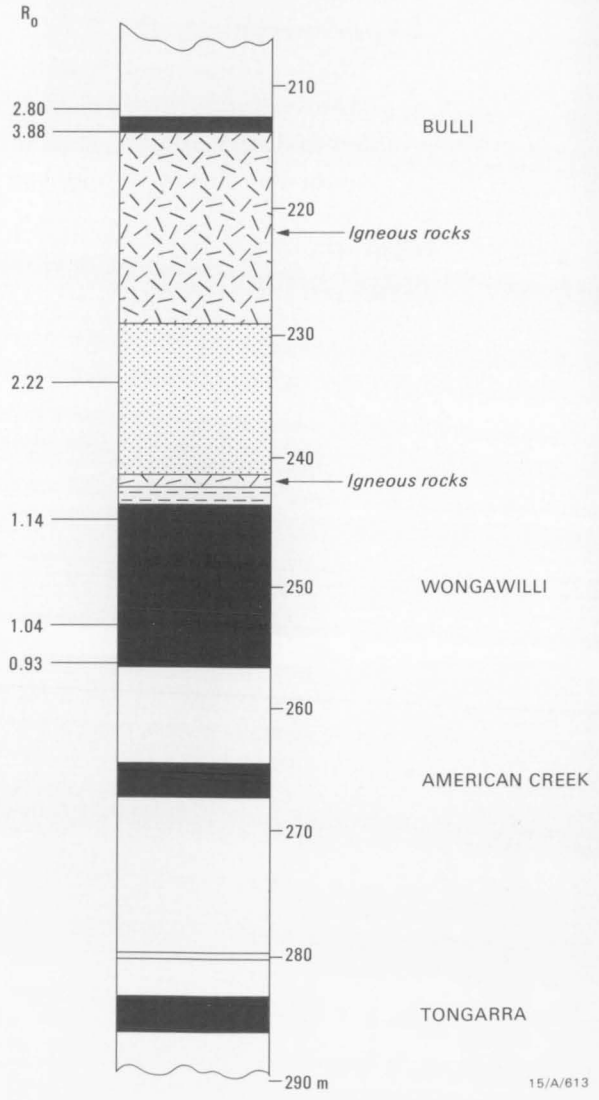


Fig. 29–1. Vitrinite reflectance data from Huntley Colliery HW DDH 2.

Huntley Colliery—15 m Thick Dyke

Coal samples were taken at intervals up to a distance of 25 m from a 15 m-thick dolerite dyke in the Huntley Colliery. Figure 29–2 shows the sampled region and the respective vitrinite reflectances. The coal rank clearly decreases away from the dyke; the regional reflectance of the Wongawilli Coal in the vicinity of Huntley Colliery is approximately 1.1%, which is reached about 15 m to 20 m from the edge of the dyke. This is a good example of the effect of igneous intrusions on the thermal metamorphism of coal with distance from the source of heat. Coal is unaffected at about one dyke width from the edge of the igneous dyke (i.e., 15 m from the edge of this particular one).

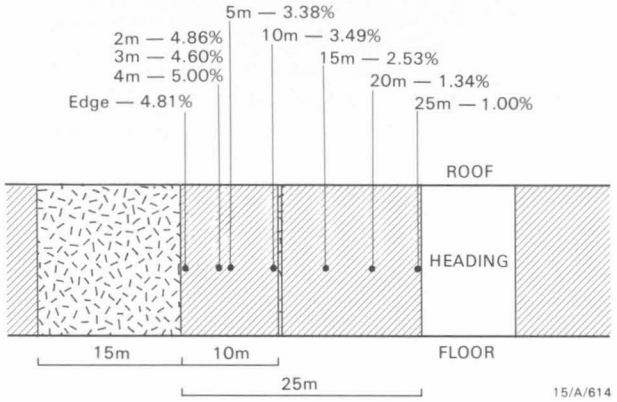
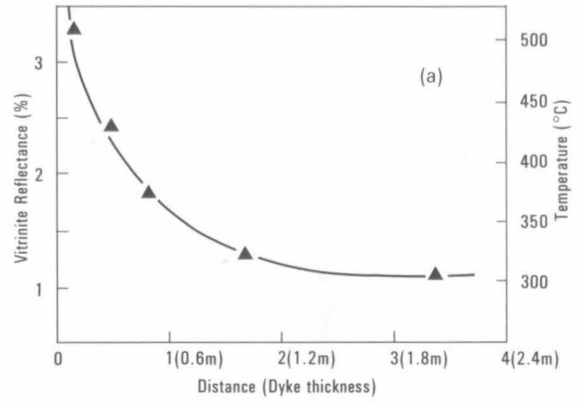


Fig. 29–2. Vitrinite reflectance data near a 15 m-thick dyke in Huntley Colliery.

South Bulli Colliery—Small Dyke (60 cm Thick)

South Bulli Colliery is about 10 km north of Wollongong in the Sydney Basin. Figure 29–3a provides vitrinite reflectance values decreasing away from a 60 cm-thick dyke in the workings of the colliery. On the vertical axis of the Fig. 29–3a is the vitrinite reflectance and the corresponding temperature, based on the curve of Bostick (1973) reproduced in Fig. 29–3b. Bostick (1973) heated coal and phytoclast bombs at various temperatures for one month to obtain a curve similar to that given in Fig. 29–3b; the curve is based on both Bostick's empirical data and that of other similar experiments reported also by Bostick (1973). A theoretical cooling curve for a 60 cm-thick dyke, from Jaeger (1959, 1964), is shown in Fig. 29–3a as the dashed line. A good correspondence between the observed reflectance data and the calculated cooling curve is evident. Such a test has been previously demonstrated by Bostick (1973): cooling of igneous bodies near coal follows the well-defined theoretical rules of cooling bodies. It appears from these data that the ambient temperature was about 300°C.



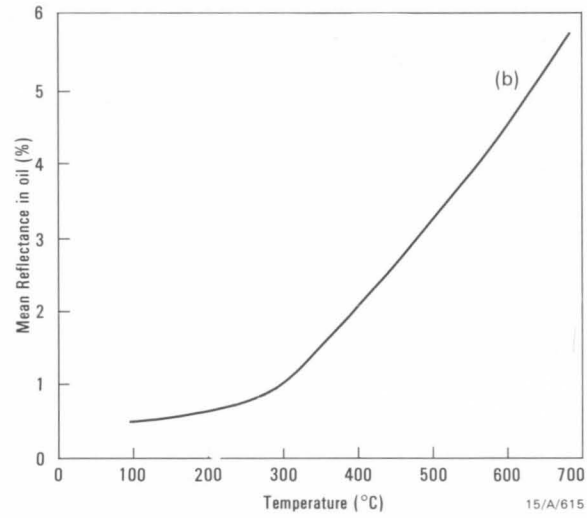


Fig. 29–3a. Vitrinite reflectance data near a 60 m-thick dyke in Bulli South Colliery.

Fig. 29–3b. Reflectance versus temperature for heating periods of up to a month (modified from Bostick, 1973).

Gunnedah Basin—Wondobah DDH1

The thermal effects of intrusions on coal rank in the Gunnedah Basin have already been described by Russell & Middleton (1981), who suggest high ranks observed in Bohena 1 to be the result of several intrusive bodies intersected by the borehole. Similarly, Wondobah DDH1, is extensively "silled". A 22 m-thick sill intersects a coal seam at a depth of 277.3 m in the well. Samples of coal in contact with the igneous material were recovered and their vitrinite reflectance was measured.

Figures 29–4 and 5 show, respectively, macroscopic and microscopic photos of the contact. Pyrite can be seen to have "settled out" of the intruded magma into the coal in Fig. 29–4. Coking and alteration of vitrinite are clearly illustrated in Fig. 29–5. The reflectance of the vitrinite in Fig. 29–5 is 3.96%. Little vitrinite is observed farther from the contact (2 cm to 20 cm: the sampled interval); semifusinite with reflectance greater than 4.5% is dominant in the sampled 20 cm interval. Extensive flow structures are evident in the coal within the 20 cm of the igneous contact.

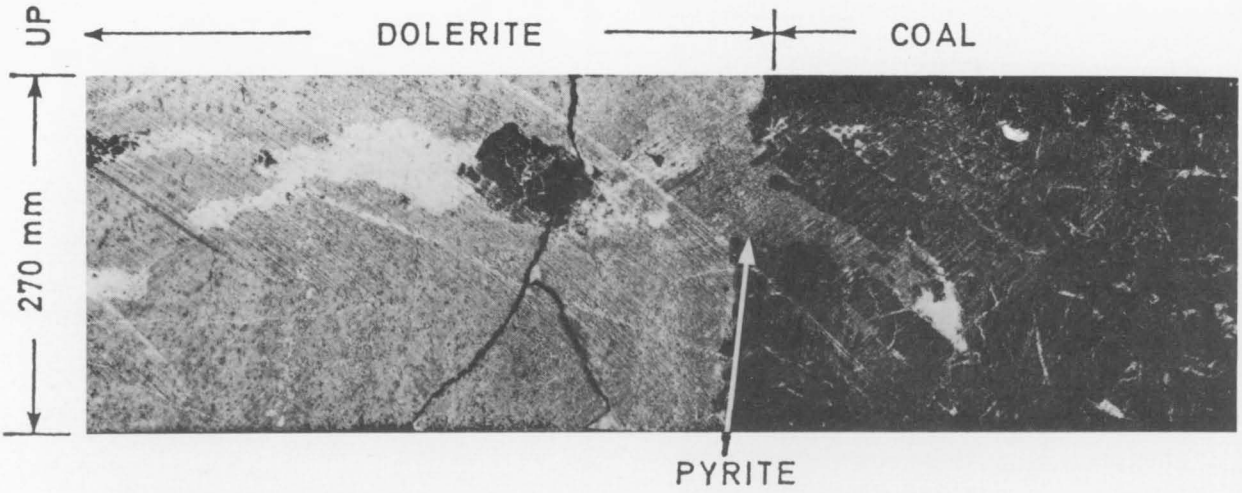


Fig. 29–4. Macroscopic photograph of a coal to dolerite contact in Wondobah-1.

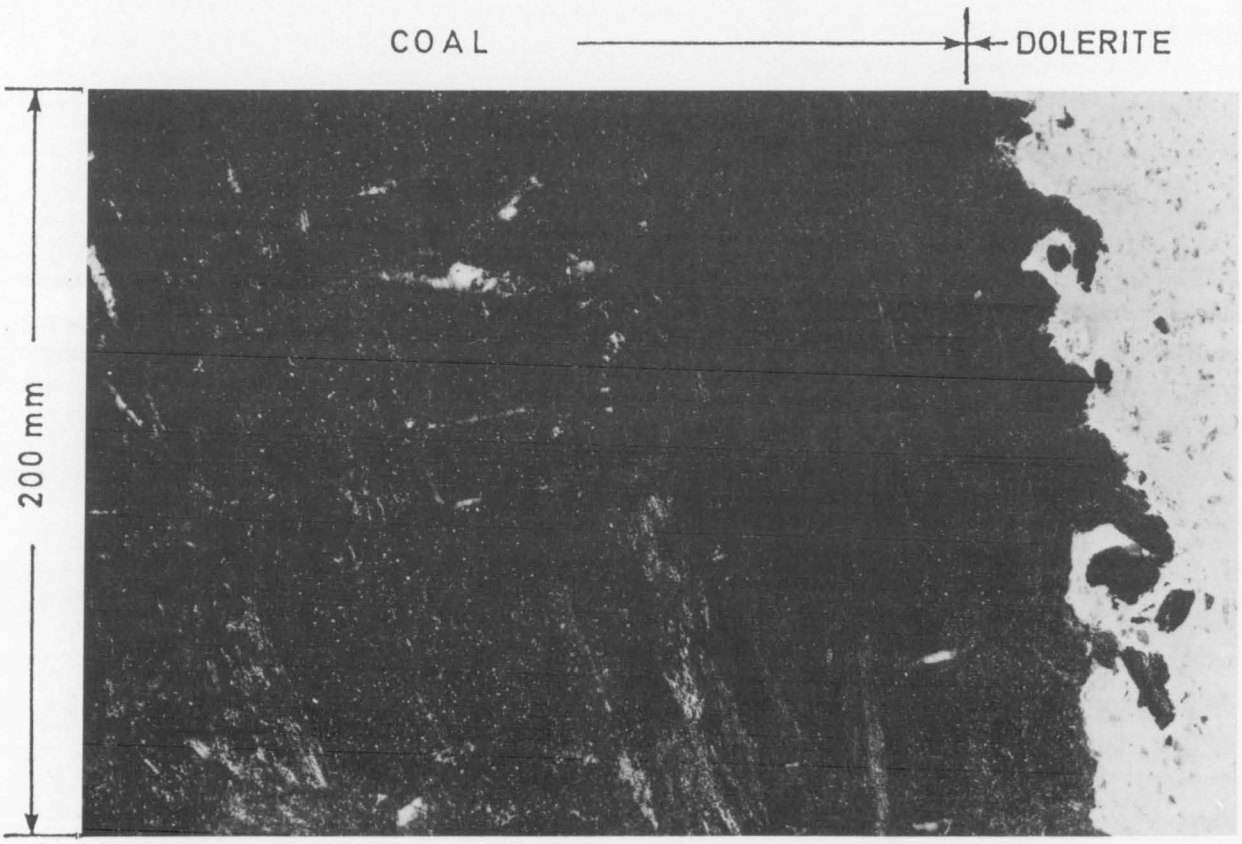


Fig. 29–5. Microscopic photograph of a coal to dolerite contact in Wondobah-1.

Coal Dykes

Britten & Taylor (1969) have described coal dykes in the Singleton Coal Measures of the Sydney Basin, and concluded that they "resulted from rapid extrusion from a very large reservoir of highly fluid coal produced at temperatures of the order of 450°C". The two researchers also noted that the coal, while not coked, is of coking rank and swell. J.W. Hunt (personal communication, 1981) has examined a coal dyke in the Moura B seam of the Moura mine in the Bowen Basin and observed a change in petrographic composition towards the centre of the coal dyke, which he considered reflects a higher rate of flow in the dyke centre. He has made these samples available for reflectance analysis; the data is given here in Fig. 29–6. The latter shows a profile of reflectance across the coal dyke. Given also in the figure is the percentage of vitrinite across the coal dyke, and temperature data converted from reflectance as based on the diagram in Fig. 29–3b. The palaeo-temperatures in the coal dyke reached about 400°C.

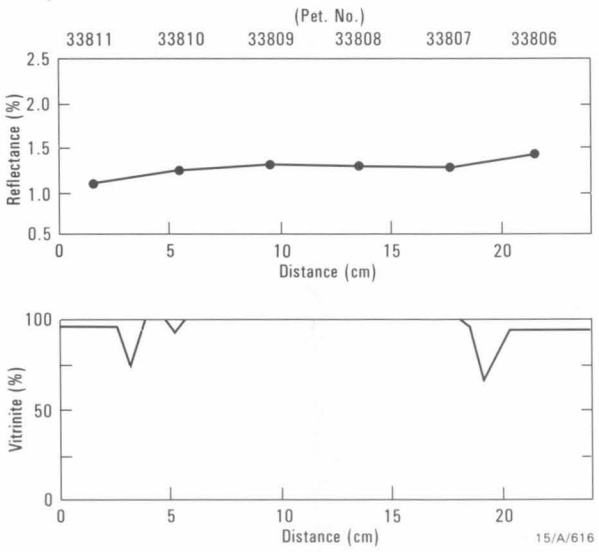


Fig. 29–6. Vitrinite reflectance data from a coal dyke in the Moura Mine in the Bowen Basin.

Conclusions

Vitrinite reflectance variation near cooling igneous dykes (or sills) can be theoretically determined by combining the empirical reflectance-heating curve (Fig. 29–3b) with the cooling dyke models of Jaeger (1959, 1964). His cooling models described instrusions with and without the effects of latent heat of cooling. These models show two important points: (a) The temperature of the country rock (coal in the present study) at the contact is half of the temperature of the intruded magma where the latent heat is negligible, and higher by the order of 100°C where latent heat is appreciable (of the order of 80–100 cal/g); and (b) the maximum temperature attained at one dyke thickness from the contact is less than a quarter of the temperature of the intruded magma.

Point (a) is important in calculating the magma termperature from vitrinite reflectance estimates near the contact, whereas (b) is important when taken in conjunction with Fig. 29–3b. Temperatures at one dyke-width distant from a contact are less than 300°C, as maximum magma temperatures are of the order of 1200°C. Figure 29b shows that 300°C corresponds to a reflectance of 1%, below which little change in reflectance occurs. Essentially, at distances greater than one dyke width from the igneous contact, temperatures are generally not sufficiently large to alter significantly the coal rank.

Coal dykes are probably formed when a highly volatile magma is intruded, and cooling of the magma does not proceed immediately. Convecting magma (to maintain heat) and build-up of volatiles (to provide pressure) are essential ingredients to the production of intrusive coal dykes.

The "dyke-width" rule, which states that rank is not changed at distances greater than one dyke width from the igneous contact, is strongly supported by the data presented here. Further, the temperatures of intruded magma can be calculated easily from vitrinite reflectance estimates of coal close to the igneous contact. As the coal rank decreases in a regular fashion away from a contact, it is possible to calculate the volume of usable and unusable coal in an intruded seam depending on the requirements of the coal.

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CHAPTER 30

Present Mining Areas

by
H.J. Harrington & A.T. Wells

Coal is the basis of Australia's largest single industry. The mining areas of Permian coals in 1984 in eastern Australia are shown on Plate 28, with its accompanying table of mines and major mining leases, working seams and annual production. That plate is augmented by Plate 29 which depicts the coal provinces of all ages over the whole of Australia in outcrop and subcrop. It also shows the amounts of coal of different ages that were produced in 1980. Marginal bar graphs give the demonstrated and inferred coal resources. In total area, the Permian coal basins of eastern Australia are comparable with the Carboniferous coalfields of Europe between Wales and the western Soviet Union (see Fig. 1–2 in Chapter 1 for a comparative text-figure.)

In the Permian coalfields (Plate 28) there are two main products, coking coal and energy coal, which tend to be produced by two sets of mines, although some mines produce both products. In the future, there might be two more sets of mines for the production of liquid fuels and for in situ gasification. By a different criterion, the mines can be divided into underground and open-pit operations; and several other variables exist for division into groups, including costs, mining methods, transport facilities, ownership, geological boundaries and State boundaries.

It is worth mentioning that during this project we interacted with a BMR group involved in the measurement of horizontal stress in Australia (horizontal pressures caused by earth movements). We realised that underground mines in Australia operate under conditions of high horizontal stress, causing severe working and safety problems. Consequently, underground mining in Australia can sometimes go to only one-third of the depths that are common in Europe; for example, 300 to 600 m as compared with 1000 m, approximately. This important situation has not yet been widely recognised. (Similar situations exist also in some other countries.) An advantage, that to some extent compensates for the stress problem, is the low sulphur content of most Australian coals.

Enormous quantities of coal are known but by far the greater part is at depths too great to be mined with present mining methods. Consequently, there are no mines in the Cooper and Galilee Basins, although the eastern edge of the Galilee Basin is a frontier of exploration and major open-pit mines could be developed in the foreseeable future, if markets can be found for the coals. The existence there of six or more seams is an advantage because blending of coals from different seams can allow a mine to meet the specifications of individual buyers.

Nearly all the production of Permian coals is confined to the Sydney and Bowen Basins, being divided between them almost equally. Both basins have a wide range of sub-bituminous coals, high-volatile bituminous coals, and low-volatile bituminous coals. There is also some semi-anthracite in the Bowen Basin (Plates 23 to 27).

In both the Sydney and Bowen Basins, the mining is in well-delineated areas. The defining features are many, including depth to coal, structure, and igneous intrusions. The first two constraints (depth and structure) can be assessed by comparing Plate 28 with the structure contour plates. Igneous intrusions are especially important in the eastern part of the northern Bowen Basin, in the Gunnedah Basin, and in parts of the Sydney Basin (Chapter 29). In the Sydney Basin, much coal has been "sterilised" or "alienated" by urban development, national parks, and by engineering works such as motorways and water-supply reservoirs, which we "protected".

Exploration for new coal deposits is becoming restricted to regions like the edge of the Galilee Basin, North Queensland, and Tasmania. Developmental drilling will continue for at least a hundred years in the Sydney, Gunnedah and Bowen Basins.

Excellent recent reviews of the prices, costs, revenues, mining methods, public policies and markets affecting Australian coal mining areas are listed in the references. The Joint Coal Board in Sydney and the Queensland Coal Board have hundreds of employees and publish maps, and much data, as do the State Geological Surveys, BMR, CSIRO, The Australasian Institute of Mining and Metallurgy, The Australian Institue of Energy, and the Coal Geology Group of the Geological Society of Australia.

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CHAPTER 31

Conclusions and Recommendations

by
H.J. Harrington & A.T. Brakel

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Conclusions

Among the main results of this study is the emergence for the first time, in some detail, of a regional synoptic view of the eastern Australian Permian coal basins. The set of structure contour and isopach maps of Plates 4 to 12 was one of the central aims of the project and represents the first drawing together of this information into a coherent whole. Contemporaneous developments in all the basins can be compared at a glance on those plates, and from them specialists will be able to obtain clues for exploration models, and can make predictions about the depth and type of coal likely to be present in a given area.

The normal tendency of State organizations is, understandably, not to work in areas beyond their State borders, but this means that the significance of regional geological events is not always apparent. A case in point is the upper coal measures, which towards the close of the Permian were accumulating in almost every minor and major coal basin from Cape York Peninsula to Tasmania, and then stopped forming at the same time in all basins just before the start of the Triassic. This had been known for individual basins and states, but the vast extent of these Late Permian events had not been fully appreciated prior to this study.

Another obstacle to regional insight has been the isolation of basins and parts of basins from each other by younger cover rocks. Over three-quarters of the five main basins have such cover, and the concealed parts can be studied only by costly drilling and geophysical surveys.

This factor, and the inevitable lithofacies variations, have resulted in an infestation of stratigraphic names, to the extent that even different parts of the same basin have separate stratigraphic schemes. Biostratigraphic terminology is similarly confusing, with Permian palaeontologists being renowned for their inability to agree on the detailed aspects of correlations (see Chapter 7). Part of the difficulty lies in the cold circumpolar climate of Australia at the time, which gave rise to endemic biotas which are hard to correlate across long distances and with the rest of the world. Petroleum exploration companies have concentrated on palynology in their biostratigraphic work, whereas State, Federal, and University palaeontologists have in addition used macrofossils. A particular problem has been the correlation of the upper coal measures between the Sydney–Gunnedah region and the Bowen Basin, separated by 650 km of concealing Mesozoic cover. An attempt to make correlations by using the concept of global changes in sea level gave useful results (Brakel, 1986, and Chapter 17), but the region was affected by tectonism in the adjacent New England–Yarrol Orogen, so that the technique has to be used with great care and can give unambiguous results only for intervals of tectonic quiescence.

Conclusions in specialized geological and technical fields are given in appropriate chapters. For example, Chapters 19 to 28 discuss coal properties (the most notable of which are rank, type, and sulphur content), and the results are presented in the texts and in many diagrams. The rank of coal in a particular area may be read from Plates 24 to 27. A broad view of Australia's coal resources can be obtained from Plate 29, and the actual mining areas in the Permian basins of eastern Australia are shown on Plate 28.

An especially useful and important product of the project is the wealth of information contained in the two extensive data-bases. The BMR CONPT Data-Base holds the stratigraphic and other data on the 496 primary control points used to construct the contour maps; in addition to the information gleaned from the voluminous literature, it presents re-interpretations of well logs made where necessary during this study. Raw data on coal properties were measured and recorded systematically for forty years by a large coal research unit in CSIRO, and those data are presented collectively for the first time in the CSIRO Data-Base; also included are new measurements made specifically for this project. The data-bases are so large that for cost reasons they had to be presented on microfiches in this publication, but copies have been deposited in three other forms (paper print-out, tape and diskettes) in BMR and in the Mines Departments of New South Wales and Queensland.

At the time of writing, the contents of Chapters 4, 17, 26 and 27 have been published as papers in journals (Beckett & others, 1983; Brakel, 1986; Middleton & Schmidt, 1982; and Middleton, 1982), and other data and conclusions have been presented at scientific meetings in Australia and overseas and in the proceedings volumes produced for those meetings (mainly abstracts and extended abstracts).

Recommendations

Almost all the black coal mines are confined to the marginal basins, and further confined mostly to the edges of those basins. Only a small part of the total coal in the ground is an economic resource at present, but that small part supports Australia's single biggest industry, the coal industry, and will continue to do so in the forseeable future. At the time of writing the industry is facing economic difficulties, but episodic expansion is likely, in part because it is inevitable that coal will be used to produce liquid fuels and chemical feedstocks as petroleum reserves decline. The expansion will involve not only Permian coals, but also thick Jurassic coals that are not discussed in this report.

The Japanese markets and the 1973 oil crisis triggered the Australian coal boom of the seventies and early eighties. There are two main markets: for coking coals and for thermal coals. It can be predicted that the European markets most probably will also grow in the long term, because many European mines are now working at or near limiting depths with present techniques, and at costs that in many cases are several times the costs in Australian mines. An increase in working depths to 1500–1600 m, using advanced engineering technology, will incur even greater costs. New lower-cost mines are being started in other countries, but the number of sites that will support new development is limited. Consequently, in the long term, the coal industry in Australia is almost certain to continue to expand, but with interruptions caused by temporary declines in world prices and by protectionist measures taken by other countries that have coal industries. Protectionist measures in some countries are affecting Australian exports very seriously at present and will probably continue to do so for another decade or two. This is a matter that is very important to Australia, but it has to be noted that although our industry is first in the world in size of exports, it is not a world giant. Its total production is one-eighth of the production in China and also far less than that in some other countries. It always has to be remembered when considering the future of the Australian industry, and scientific investment in it, that not only is it not a world giant, but that one-third of its production is for electricity production and other controlled domestic markets, and that the other two-thirds go to what are often special-situation export markets that take only a small part of total world production. There are hundreds of kinds of coal, and even more kinds of market specifications and prices within the two main families of thermal coals and coking coals, and the markets are also sought by other countries, so that market shares in them are continually fluctuating. These factors have to control research investments and it will not always be easy to choose what research and training is required, and at what cost.

In the recent boom period in Australia there was a concentration on open-cut developments, the industry being quick to explore and develop open-cut mines on leases which were spread over an area roughly equal in size to all the Carboniferous coalfields of Europe, from Wales, England and Scotland to Poland (Fig. 1–2). From the present survey, however, it is clear that future expansion must be mainly by underground workings, so that a big and gradual change in the coal industry is inevitable, and must be accompanied by changes in scientific and technological research.

This report shows that in the marginal basins nearly all the areas that are mineable at present have been allotted either for exploitation, or have been reserved for future State purposes such as electricity generation, or for the domestic steel industry, or for a future coal liquefaction industry. Much coal has been "sterilised" under towns, roads, railways and water reservoirs, and in National Parks. The coal "lost" in this way amounts to hundreds of millions of tonnes, and is constantly increasing without much consideration, or any, in some cases. A new motorway can sterilise very large amounts of coal under hundreds or thousands of hectares of land (say 140 million tonnes per thousand hectares). Possibilities exist, however, for a few new ventures in the Upper Hunter region, the Sedgefield–Belford area, offshore parts of the Sydney Basin, the Gloucester Basin, and in some portions of the Bowen Basin – but the Gunnedah Basin is by far the biggest undeveloped area. It has lagged behind other areas because of transportation costs, which could be reduced if a low-level railway tunnel is put through the Liverpool Range and if the railway is electrified. Large coal areas in the Gunnedah Basin have been reserved for the long-term, for electricity generation, but it is recommended that planners note that other major developments will occur there. Requirements for coal developments are: water supplies, the expansion of some country towns, port facilities and other transport arrangements, education facilities and taxation policies, to name but a few. In this report, the Gunnedah Basin is the subject of a special chapter which was based on a major and expensive drilling program by the New South Wales Department of Mineral Resources, followed by seismic traverses and sedimentological studies.

In many other areas, the geology is only known to reconnaissance standard, but detailed knowledge will become critical even in existing workings as they are extended down-dip. One problem is that the virgin horizontal tectonic stress in most Australian coalfields is unusually high by world standards, and causes difficulties in underground mining, such as very dangerous rock bursts and gas bursts. It is recommended that much more short and medium-term research should be done on this. Horizontal stress at some points has been determined by BMR researchers, but that work should be expanded somewhat and placed in a special unit which would co-operate with a mining research organisation when enough measurements have been made. It is difficult and costly to make the stress measurements and requires highly trained people, but the work must be carried out because of the special geological environment in eastern Australia and its effect on our most important industry.

Another widespread problem is best discussed by using as an example the mines in the Greta Coal Measures in the Cessnock district. They are currently working at depths of about 300 m, and are advancing towards 400 m. Southwards of the 400 m line, the cover on the coal increases steadily to about 750 m, but then very rapidly to over 1000 m as the coals dip under an escarpment of Triassic sediments about 300 m high. At those depths, the coals are simply inaccessible, in both safety and economic terms, by present mining techniques,

because the static load of the rock cover is so great. Similar escarpments occur down-dip from the workings in many of the mining districts. The central Sydney Basin has enormous coal reserves with good coking properties, but they are inaccessible economically because of their thick Triassic cover. The southern half of the Bowen Basin is another example of the same problem, being covered by up to 1500 m (approximately) of Jurassic and Cretaceous sediments of the Surat Basin. It is recommended that research on this should be started to meet medium-term needs down-dip from existing workings.

There are also other longer-term needs similar to those mentioned above. The large interior basins, most notably the Cooper and Galilee Basins, have enormous quantities of coal, but only those at the eastern edge of the Galilee Basin can be worked at present. Most of the coal is not excessively deep (see Plates 4–7, 9–11), but it is nevertheless too deep for current mining techniques. New technologies, such as underground coal gasification (UCG) or robot mining, will probably develop sufficiently to change that situation in the long term, because there will be an economic drive in that the coals are a major energy resource by world standards. Opinions on UCG are often pessimistic in the West, but in the USSR which leads the world in this field there are two gasification stations that have been producing since 1967 and 1959, respectively (Zvyaghintsev, 1982).

Planners and others should note that the quantities of solid fossil fuels, both in the interior basins and under thick cover in the marginal basins, are really enormous. The energy in them is many times greater than the energy in Saudi Arabian petroleum reserves. They are a major national resource justifying long-term planning; in due time, appropriate investigation by drilling and research into methods of exploitation (including UCG and robot mining) could be carried out as indicated above. Deep mining problems are not new in Europe, and research is under way there to allow mining safely to depths of 1500 m or even 1600 m, using new gallery designs and other advanced engineering techniques (Roest, 1982).

Much of the deep coal in Australia is being discovered incidentally in the course of petroleum exploration. Although the basic details of any coal measure sequences are recorded on the well logs in many deep basins, there is little incentive for the exploring companies to undertake further detailed follow-up studies. The principal reasons for this are the great depth and presently uneconomic nature of these resources, the generally wide spacing of the drill holes, and the fact that hydrocarbon discovery obviously constitutes their main brief.

In parts of some basins, detailed syntheses of sequences that contain deep coal measures have been undertaken chiefly by government agencies. For example, a comprehensive study has been made in the South Australian portion of the Cooper Basin and has been used as a basis for basin-wide palaeogeographic and environmental reconstructions. Similar studies are continuing mainly because there is closely spaced well control.

However, in most deep basins only regional studies have been undertaken of coal rank and type, on dispersed organic matter or coal recovered fortuitously in cores.

Obviously, in petroleum exploration detailed investigations of coal measures are of secondary concern. Drill cores are at a premium and potential hydrocarbon source and reservoir rocks are the primary targets. It would be unreasonable to demand of oil explorers that they do detailed and costly work on a material that will have economic value in the long term, but has none at present if it is deeper than 400 m. Nevertheless, the resource is so great that we recommend that a method be found to finance, and offer some incentive for, the investigation in a systematic way of the coals in selected petroleum exploration bores in coal basins. Eventually, perhaps in less than two decades, the coals will become a far greater accessible resource than the petroleum in the same basin. Opportunities to survey them cheaply are being passed by or wasted.

Coal research is becoming increasingly sophisticated. Forty years ago, when "coal was king", BMR started its major series of studies of coal basins in co-operation with the relevant States. The CSIRO fossil fuels unit was also established then, and was the only national research organisation working on the chemistry and physics of Australian coals. It was given encouragement even through the decades when coal declined in importance domestically and almost none was exported. In the last few years, the unit has been incorporated in the Division of Fossil Fuels and has lost staff. It is our final recommendation that the unit be re-established in strength, and if that is impossible within the CSIRO, perhaps it could be done in BMR. Australia needs such a fossil fuels research unit to do work on undeveloped coals, especially if it wishes to have an indigenous capacity to understand and use the research done in the U.S.A., Japan, Europe, and Canada — the countries which are either our competitors for coal exports, or the consumers of our coals.

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APPENDIX A

The BMR CONPT Data-Base of Stratigraphic Control Points in Eastern Australian Permian Coal Basins

by
S. Radke, J.M. Totterdell & A.T. Brakel

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Introduction

From 1980 to 1984, BMR and CSIRO undertook a joint NERDDC-funded project on the Permian Coals of Eastern Australia. As part of the final report, a series of 1:2 500 000-scale structure contour and isopach maps were produced to illustrate the distribution and morphology of horizons in the coal-bearing sedimentary basins. The data for these maps were drawn from published and unpublished geological studies. Initially it was intended to select control points with an average 25 km spacing, but owing to the distribution of geological units, and hence of research and exploration work, the actual spacing became less regular.

A computerized data-base, CONPT, was created to store control point information and facilitate data searching and computer plotting for map compilation. It was decided to include any data potentially useful to the project, and not restrict the data-base to contour information. As a result, CONPT stores a variety of data for each stratigraphic control point.

The structure of the data-base, and the printout format, were designed to the requirements of the project geologists by S. Radke with assistance from J.M. Totterdell, and in conjunction with staff from BMR's ADP section, notably J. Barlow and E. Anderson. A.T. Brakel, A.T. Wells, and P.E. O'Brien selected the control points from the literature for the respective basins for which they had responsibility. The relevant data were then put onto coding forms by S. Radke and J.M. Totterdell, and entered into BMR's HP1000 computer. While preparing the printout for its present microfiche form, A.T. Brakel spent considerable time updating and editing the data-base, and standardizing the control point names for greater ease of use.

CONPT was documented in detail by Radke & Totterdell (1984), who dealt with, among other things, the structure of the data-base and software, an explanation of the coding forms and files created for CONPT, and applications examples. Much of this information has now become obsolete, because at the time of writing BMR is changing over from the old HP1000 to a Data General computer system, with attendant changes in data-base structure and software. Those who wish to access CONPT by computer should contact BMR's ADP Applications Section for the appropriate procedures.

An example of the use of CONPT is the set of Control Point Distribution maps of Plates 36 to 42, plotted on a scale of 1:1 000 000 for each basin. The maps are of rough compilation sheet quality, but are useful in locating the control points of the data-base. The points are labelled by reference numbers, which may be identified by using the Key to Reference Numbers file on Card 6.

The maps may also be plotted using as input any selected variable from the data-base. Such working maps were used in compiling the contour charts, with values for base elevation or thickness printed alongside control point locations.

The following is intended as a guide for users of the microfiche version of CONPT.

Notes on the CONPT Data-Base

The CONPT printout consists of two sections: (i) the main stratigraphic section, comprising general information on the control points (e.g., location, elevation, etc.), literature references, and stratigraphic data; and (ii) a separate coal analyses section.

Main Stratigraphic Section

In the stratigraphic section (Microfiche Cards 1 to 5), the control points have been grouped into their respective basins, or parts of basins, e.g., Cooper Basin, Sydney Basin-North. The basins on each card are listed in Fig. App.A-1, and also in the first frame on Card 1. The boundaries of subdivisions used in the Sydney and Bowen Basins are shown in Figs 3–2 and 7–3, respectively. Within each basinal division, the control points are given in alphabetical order of names. Note that no organizational prefix is included in the name; thus, even if a bore is usually reported in the literature with such a prefix (e.g., DM Stockton DDH 3, GSQ Eddystone 1), in the data-base it is listed in the form Stockton DDH 3, Eddystone 1. The only exceptions are the pair GSQ Jericho 1/AOD Jericho 1, which otherwise could not be distinguished, and drillholes with "irregular" names, or numbers instead of names, e.g., AAO 7 Arcadia, DMC BD1. Note also that the numeric part of the name is left-justified by the computer, so that names are ordered in numberical sequence of the left-hand digits first,

e.g., Drake NS 10
Drake NS 19
Drake NS 2
Drake NS 20
Drake NS 24R
Drake NS 7
Drake NS 7,8,10,12
Drake NS 8

(A similar left-justified numerical ordering can be seen in the Control Point Location file on microfiche Card 6, where points are ordered according to their reference numbers, e.g., S1, S10, S100, S101, S102, ... S109, S11, S110, S111, ... S119, S12, S120, ... S124, S13. S14, etc.)

PERMIAN COALS OF EASTERN AUSTRALIA

BMR CONPT DATA-BASE

CONTENTS

1	2	3
Sub-Laura Basin	Bowen Basin - SW (cont.)	Bowen Basin - Sub-Surat (cont.)
Mt. Mulligan Basin	Bowen Basin - Sub-Surat (part)	Gunnedah Basin
Calen Basin		Gloucester Basin
Blair Athol Basin		Myall Syncline
Wolfang Basin		Sydney Basin - North
Karin Basin		
Bowen Basin - North		
Bowen Basin - Central		
Bowen Basin - SE		
Bowen Basin - SW (part)		

4	5	6
Sydney Basin - Central	Galilee Basin	Coal Analyses
Sydney Basin - West		Control Point Locations
Sydney Basin - South		Key to Reference Numbers
Oaklands Basin		Abbreviations and Contractions
Cooper Basin		Organization Abbreviations
		Petroleum Wells

Fig. App. A-1. Contents of microfiche cards 1 to 6: BMR CONPT Data-Base, Permian Coals of Eastern Australia.

Each control point has been given a reference number, e.g., G29, consisting of a basin letter prefix, and a numeric code, the latter usually in roughly north to south geographic order. The basin prefixes are:

A: Galilee Basin
B: Bowen Basin (exposed part, including nearby minor basins)
C: Cooper Basin
G: Gunnedah Basin
K: Oaklands Basin
L: sub-Laura Basin
M: Mt. Mulligan Basin
S: Sydney Basin (including nearby minor basins)
T: Bowen Basin (sub-Surat part).

To this may be added an interpretation code, such as X1 or Y2, e.g., B92 Y2. The X1 indicates an interpretation used in the project, where this differs from the interpretation in the literature, or where more than one interpretation has been published. Y1, Y2, etc., refer to the various published interpretations. If the point is a component used to assemble a composite control point, it may be identified as such by a letter A, B, C, D, etc., in the place of Y1, etc. A is the stratigraphically highest component, B, C, D, etc., progressively lower.

Near the top of the printout for each point are given the organization which drilled the hole or measured the section; the type of control point (e.g., DDH; RDH with core + wireline; section; etc.); the number of the 1:250 000 Sheet area in which the point lies; the latitude and longitude; the elevation of the ground surface (in metres) above sea level; the reference elevation from which depths in the bore were measured; the elevation of the bottom of the hole relative to sea level; the total depth of the hole; and a status code for composite control points and multiple interpretations. Status codes which may be used are:

C: a control point which is a composite of more than one drill hole (e.g., Hillalong NS 1–4)

*: a component hole used to assemble a composite (e.g., Hillalong NS 2)

*Z: a component hole used to assemble a composite, when its location is also assigned as the location of the composite point (e.g., Hillalong NS 1)

?: a control point for which several stratigraphic interpretations exist (e.g., Comet 1).

Composite control points have been put together from a number of individual drill holes or sections to simulate one deep drill hole, when none of the components by themselves are adequate to specify a stratigraphic sequence. Usually, the composite has been assigned the location of the stratigraphically highest component hole, and the data from the other components extrapolated to it (see Fig. App.A-2 for the Hillalong 1–4 example). Some composites were already published, others were erected for this project. A further example will help to clarify composite control points:

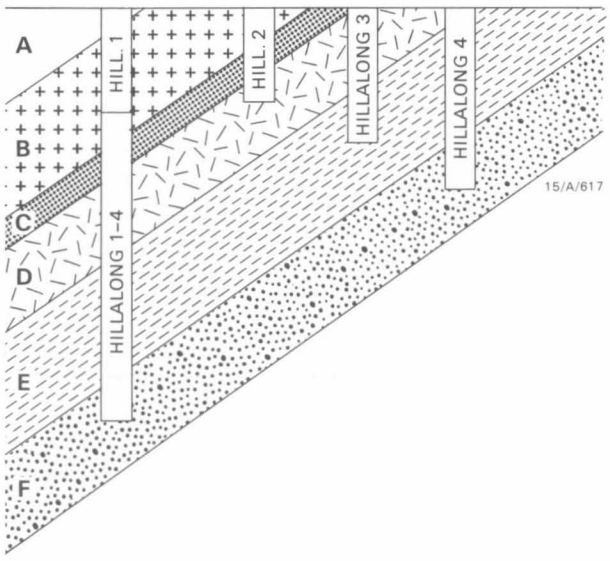

Fig. App. A-2. Derivation of the composite control points Hillalong 1–4 from its four component bores.

Name	Ref. No.	Status Code	Description
Caroa	B69	C	Composite of A, B, C
EM 134	B69 A	*Z	Component with location of composite
EM 138	B69 B	*	Component
EM 136	B69 C	*	Component

Note that while most composite points have a name similar to their component points, e.g., Hillalong 1–4, this is not always the case, as the Caroa example shows. Composites and their components can be identified from the Key to Reference Numbers file on Card 6, where such sets of points are grouped together under the same reference numbers, distinguished only by the suffixes A, B, etc.

Following the identification details of a control point, the printout next gives the literature references and cross-references for each of its interpretations, and the sedimentary basin or subdivision in which it is located.

The stratigraphic data are cited for each geological unit in turn, starting at the top of the section. If more than one interpretation exists for a drill hole, the complete stratigraphic sequence according to one interpretation is given first, then the sequence for the next, and so on. Each interpretation of each stratigraphic unit has been assigned an alphanumeric interpretation code. The first two characters indicate which interpretation of the stratigraphy is being used; the last two numbers give the stratigraphic order of the unit. For example, Y205 indicates the fifth unit in the list for that control point, for the second interpretation taken from the literature (Y2); and X103 indicates the third unit in the interpretation used in our report (XI). For the base of each geological unit, the depth in the drill hole is that measured from the reference elevation of the hole (in metres), and its elevation is relative to sea level. Where drilling stopped within a unit, so that the depth to base for that unit is unknown, this is indicated as TD (total depth reached), and the base elevation shown, marked *, is that of the bottom of the drill hole. The thickness of such a unit is preceded by >, to denote a minimum thickness value. Where possible, apparent thickness is corrected to true thickness in dipping or faulted strata, and is indicated by t after the number. *If subtraction of the depths of the top and base of a unit gives a value different from the quoted thickness, a correction for true dip would have been made*. The depths cited for other geologic features are those of their bases. The abbreviations used throughout are listed in the Abbreviations and Contractions file on Card 6.

Coal Analyses Section

Coal data encountered incidentally during the compilation of the main stratigraphic section of CONPT are recorded in the Coal Analyses file at the start of Card 6. This information is complementary to that in the CSIRO Data-Base. The basin, latitude, and longitude for each control point in the file are provided, but for further control point information, see the stratigraphic section.

Abbreviations used are listed in the Abbreviations and Contractions file on Card 6, except for the following:

Bppm	Boron, parts per million
Cl%	Chlorine, percent
CMP	Composite sample
FC	Fixed carbon
FTS	Floats fraction
I%	Inertinite, percent
# Sms	Number of seams analysed
P%	Phosphorus, percent
%	Exinite, percent
%Rec	Percentage of section recovered/analysed
S%	Sulphur, percent
VM	Volatile matter
V%	Vitrinite, percent
VTRF	Vitrinite reflectance

Other Files

The following files are also included on Card 6:
Control Point Locations — lists control points in alphanumeric order (left-justified) of reference numbers, with latitude and longitude for each.
Key to Reference Numbers — lists control point name and basin for each reference number, in alphanumeric order (left-justified) of reference numbers.
Abbreviations and Contractions — as used in CONPT.
Organization Abbreviations — lists the company prefix abbreviations used in the Petroleum Wells file.
Petroleum Wells — an index of the petroleum exploration wells, used in CONPT, for each basin. The company or consortium which drilled each well is indicated by a prefix to the well name, as given in the Organization Abbreviations file.

Reference

Radke, S., & Totterdell, J., 1984—BMR data-base CONPT documentation. *In* Harrington, H.J., & others—Permian Coals of Eastern Australia. *National Energy Research Development and Demonstration Council, Report on Project 78/2617*, Vol. 4.

APPENDIX B

PERMIAN COALS OF EASTERN AUSTRALIA

BMR CONPT DATA-BASE

CONTENTS

1

Sub-Laura Basin
Mt. Mulligan Basin
Calen Basin
Blair Athol Basin
Wolfang Basin
Karin Basin
Bowen Basin - North
Bowen Basin - Central
Bowen Basin - SE
Bowen Basin - SW (part)

2

Bowen Basin - SW (cont.)
Bowen Basin - Sub-Surat (part)

3

Bowen Basin - Sub-Surat (cont.)
Gunnedah Basin
Gloucester Basin
Myall Syncline
Sydney Basin - North

4

Sydney Basin - Central
Sydney Basin - West
Sydney Basin - South
Oaklands Basin
Cooper Basin

5

Galilee Basin

6

Coal Analyses
Control Point Locations
Key to Reference Numbers
Abbreviations and Contractions
Organization Abbreviations
Petroleum Wells

SUB-LAURA

BASIN

CONTROL POINT : BREEZA PLAINS 1

REFERENCE # L2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CRUSADER OIL	RDH, CORE + WIRELINE	SD/54-12	14 44'20"S	143 55'07"E	+15	+19	-968	987	

REFERENCE: HARDY, J.W.J.
CRUSADER OIL N.L. BREEZA PLAINS NO.1 AND LAKEFIELD NO.1, WELL COMPLETION REPORT
BUREAU OF MINERAL RESOURCES, AUSTRALIA, FILE 70/650 (UNPUBLISHED) Page Publn Year: 1970

Cross Reference:

SEDIMENTARY BASIN: SUB-LAURA

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:79 Base Elevation: -60 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLENA CLST Age: CRETACEOUS Interpretation Code:X102
Basal Information: Depth to Base:139 Base Elevation: -120 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BATTLE CAMP SH Age: CRETACEOUS Interpretation Code:X103
Basal Information: Depth to Base:280 Base Elevation: -261 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BATTLE CAMP SST Age: CRETACEOUS Interpretation Code:X104
Basal Information: Depth to Base:491 Base Elevation: -472 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALRYMPLE SST Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:923 Base Elevation: -904 Thickness: 432
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -968 ± Thickness:)64

Geologic Description: INTBDD V HARD GY F-M TFAC MICAC CARB FLD SST, DK GY HARD BRITTLE CARB MICAC TFAC VAR SANDY SLIST & DK GY HARD BRITTLE SILTY MICAC CARB PY SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LAKEFIELD 1

REFERENCE # L3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CRUSADER OIL	RDH	SD/54-12	14 53'44"S	143 59'01"E	+28	+32	-898	930	

REFERENCE: HARDY, J.W.J.
CRUSADER OIL N.L. BREEZA PLAINS NO.1 AND LAKEFIELD NO.1, WELL COMPLETION REPORT
BUREAU OF MINERAL RESOURCES, AUSTRALIA, FILE 70/650 (UNPUBLISHED) Page Publn Year: 1970

Cross Reference:

SEDIMENTARY BASIN: SUB-LAURA

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:48 Base Elevation: -16 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLENA CLST Age: CRETACEOUS Interpretation Code:X102
Basal Information: Depth to Base:203 Base Elevation: -171 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BATTLE CAMP SH Age: CRETACEOUS Interpretation Code:X103
Basal Information: Depth to Base:359 Base Elevation: -327 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BATTLE CAMP SST Age: CRETACEOUS Interpretation Code:X104
Basal Information: Depth to Base:562 Base Elevation: -530 Thickness: 203
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALRYMPLE SST Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:921 Base Elevation: -889 Thickness: 359
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -898 # Thickness:)9

Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks AGE NOT KNOWN BUT PROBABLY PERMIAN (THIS WOULD BE CONSISTENT WITH OTHER GRANITES IN THE AREA)

CONTROL POINT: MARINA 1

REFERENCE # L1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CABOT-BLUEBERRY	RDH, CORE + WIRELINE	SD/54-12	14 38'10"S	143 52'30"E	+21	+24	-1143	1167	

REFERENCE: MINES ADMINISTRATION PTY LTD
CABOT-BLUEBERRY MARINA NO.1, AUTHORITY TO PROSPECT 61P, QUEENSLAND, WELL COMPLETION REPORT
BUREAU OF MINERAL RESOURCES, AUSTRALIA, FILE 62/1214 (UNPUBLISHED) Page Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: SUB-LAURA

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:67 Base Elevation: -43 Thickness: 64
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LAURA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1087 Base Elevation: -1063 Thickness: 1020
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNITS 'B' & 'C' OF W.C.R.

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1154 Base Elevation: -1130 Thickness: 67
Geologic Description: PREDOMINANTLY SHALE OR CLAYSTONE WITH MINOR SANDSTONE INTERBEDS & SOME TUFFS. TRACE OF COAL & LIGNITE. SINGLE INCOMPLETE GLOSSOPTERIS LEAF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
GLOSSOPTERIS 1149 -1125
Tectonic Structure:
Remarks CALLED UNIT 'D' IN W.C.R.

STRATIGRAPHY: BASEMENT Age: NOT SPECIFIED Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -1143* Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

MOUNT

MULLIGAN

BASIN

CONTROL POINT: MOUNT MULLIGAN

REFERENCE # M1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	GENERALISED SECTION	SE/55-1	16 49'41"S	144 49'40"E	+780				

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: DE KEYSER, F., & LUCAS, K.G., 1968, BUR. MIN. RES. AUST. BULL. 84, 61-62, 93-94
HAWTHORNE, W.L., 1975, AUSIMM MONOG. SERIES 6, 252-254

SEDIMENTARY BASIN: MOUNT MULLIGAN

STRATIGRAPHY: PEPPER POT SANDSTONE Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base: Base Elevation: Thickness: 300
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIP GEN <20 DEG EXCEPT ON FAULTED EDGE
Remarks THICKNESS APPROXIMATE

STRATIGRAPHY: MOUNT MULLIGAN CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base: Base Elevation: Thickness: 240
Geologic Description: BASAL SECTION - CGL CONTAINING FRAGS OF HODGKINSON FM & RHY PEBS; UPPER SECTION - THINLY BDD SEQ OF COAL, CLAY & F SST (DE KEYSER & LUCAS, 1968)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL: NO. 1 SEAM 1.1
COAL: NO. 2 SEAM 1.7 AV
COAL: NO. 3 SEAM 0.6 AV
NO.4 SM NOT WORKED
Tectonic Structure: DIP GEN <20 DG EXCEPT ON FAULTED EDGES
Remarks MAX THICKNESS (240M) IN NE. THINS TO THE SOUTH. 35 M AT STATE MINE; NOT PRESENT 2.5 KM FURTHER SOUTH (HAWTHORNE, 1975)

CALEN

BASIN

CONTROL POINT: HILLALONG NS 5

REFERENCE # B18

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-8	21 04'25"S	148 56'47"E	40	41	-266	307	

REFERENCE: X1 KOPPE, W.H.
DEPARTMENTAL DRILLING IN THE CALEN COAL MEASURES
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/36 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: CALEN

STRATIGRAPHY: CALEN COAL MEASURES Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: TD Base Elevation: -266' Thickness: >293'
Geologic Description: QTZ AND LI-LA ARENITE, SH, ACID-INTMED INTRUS, MNR CARB MDST & COAL. INDURATED, MASSIVE, XBDD, FLASER BDG, LAMD. SH CLASTS, PLANT FRAG, BURROWS
Reported Environment: FLUVIAL; OVERBANK WITH POSSIBLE TIDAL INFLUENCE; SWAMP AND CHANNELLED SWAMP
Interpreted Environment:
Geologic Features:

feature	Depth	Elevation	Thickness
INTRUSIVES	T'OUT		

Tectonic Structure: DIPS 5-40 DG. FRACT, BRECD, DYKES, SILLS
Remarks THICKNESS CORRECTED FOR 17 DEG DIP.

BLAIR

ATHOL

BASIN

(BOWEN NORTH: BLAIR ATHOL)

CONTROL POINT: BC.M18

REFERENCE # B53

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CRA?	DDH	SF/55-11	22 41'43"S	147 32'49"E	+325	+325	+241	84	

REFERENCE: FOSTER, C.B.
PERMIAN PLANT MICROFOSSILS OF THE BLAIR ATHOL COAL MEASURES, BARALABA COAL MEASURES, AND BASAL REWAN FORMATION OF QUEENSLAND
GEOLOGICAL SURVEY OF QUEENSLAND PUBLICATION 372 PALAEO. PAPER 45 Page 6-12, 115 Publn Year: 1979

Cross Reference:

SEDIMENTARY BASIN: BOWEN NORTH: BLAIR ATHOL

STRATIGRAPHY: BLAIR ATHOL CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: 241 Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 325 M(AT SURFACE). VALUES USED FOR CONTOUR MAPS.

STRATIGRAPHY: BLAIR ATHOL CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +241 # Thickness:)84
Geologic Description: MINOR BASAL CONGLOMERATE, SANDSTONE, CARBONACEOUS SHALE AND SILTSTONE WITH INTERCALATED COAL SEAMS
Reported Environment: NON-MARINE; DEPOSITED IN SMALL INTERMONTAINE BASIN
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PALYNO. SAMPLE P1083	42	+283	
COAL	45	+280	0.6
COAL	74	+251	26
COAL	82	+243	2.8

Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +241 # Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLAIR ATHOL CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +241 # Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLAIR ATHOL CM OF GEBBIE SUB-GP

WOLFANG

BASIN

(BOWEN, NORTH: WOLFANG)

CONTROL POINT: DMC BD1

REFERENCE # 854

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DAMPIER MIN. CO.	DDH	SF/55-11	22 43'53"S	147 37'51"E	+270	+270	-200	470	

REFERENCE: CARR, A.F.
COAL RESOURCES OF THE WOLFANG BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1980/17 : Page Publn Year: 1980
Cross Reference: COOK FW AND TAYLOR CP 1979 QLD GOVT MINI49

SEDIMENTARY BASIN: BOWEN, NORTH: WOLFANG

STRATIGRAPHY: BLAIR ATHOL CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:413 Base Elevation: -143 Thickness:)373
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 230 MIAT SURFACE).VALUES USED CONTOUR MAPPING

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -143 Thickness:)57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:40 Base Elevation: +230 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLAIR ATHOL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:413 Base Elevation: -143 Thickness:)373?
Geologic Description: CONGLOMERATE, LT GY QZ SANDSTONE, GY SILTSTONE, AND GY-BK GY MUDSTONE WITH COAL SEAMS
Reported Environment: FRESHWATER, LACUSTRINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	94	+176	25
COAL	141	+129	9
COAL	218	+52	33

Tectonic Structure: DIP VARIABLE ()45 DG IN PARTS
Remarks NOT TRUE THICKNESS AND NOT CORRECTED BECAUSE OF EXTREME VARIABILITY IN DIP,WOLFANG BASIN FAULTED ALONG WESTERN MARGIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:413 Base Elevation: -143 Thickness: 373
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLAIR ATHOL CM.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:413 Base Elevation: -143 Thickness: 373
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLAIR ATHOL CM OF THE GEBBIE SUB-GROUP

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -200 ± Thickness: >57
Geologic Description: ARENITE, SHALE, COAL, AND COAL SH
Reported Environment: DELTAIC (COOK AND TAYLOR, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY SHALE	421	-151	7
COAL AND COALY SHALE	444	-174	10

Tectonic Structure:
Remarks

KARIN

BASIN

(BOWEN, NORTH: KARIN)

CONTROL POINT: DMC DDH 37

REFERENCE # 858

Organ...	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Depth	status code
DAMIES MIN. CO.	DDH	SF/55-11	22 55'32"S	14...	+240	+240	+2	+238	

REFERENCE: COOK, F.W., AND TAYLOR, C.P.
PERMIAN STRAT OF THE WOLFANG BASIN
QUEENSLAND GOVERNMENT MINING JOURNAL, 80 Page 342-349 Publn Year: 1979

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH: KARIN

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +2 ± Thickness:)238
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +2± Thickness:)230
Geologic Description: CONGLOMERATE, SILTSTONE, AND COAL SEAMS DOMINATE, ABUNDANT GLOSSOPTERIS PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	27	+213	2
COAL	54	+186	2

Tectonic Structure:
Remarks KARIN BASIN MAY CONTINUE SOUTH EAST TOWARDS CAPELLA.

BOWEN

BASIN

NORTH

CONTROL POINT: BCCM NS 371

REFERENCE # B2	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	BOWEN CONSOL C M	DDH	SF/55-3	20 34'12"S	147 50'17"E		+194	-188	382	

REFERENCE: MALONE, E.J., JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE SOUTHERN HALF OF THE BOWEN 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 130 Page 36-40;PL 6 Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:381 Base Elevation: -187 Thickness: 231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 44 M. VALUES USED FOR CONTOUR MAPS.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:150 Base Elevation: +44 Thickness: 150
Geologic Description: LT GY-GY MICACEOUS PYRITIC SLTST, VERY FINE GRAINED SST AND GRANULE-PEBBLE CONGLOMERATE; MARINE FOSSILS
Reported Environment: ENTIRELY MARINE. BIG STROPHALOSIA ZONE - TURBIDITY CURRENT DEPOSIT?
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BIG STROPHALOSIA ZN	33	+161	23

Tectonic Structure:
Remarks

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:381 Base Elevation: -187 Thickness: 231
Geologic Description: VF-C SST (OCCAS MICAC OR PY), BLK-DK GY SH, DK GY-GY SLTST (OCCAS PY), COAL AND INTRUSIVES; PLANT FOSSILS, CARB BEDS, MARINE FOSSILS IN GLENDOO
Reported Environment: DELTAIC OR PALUDAL. GLENDOO SST MB FORMED DURING A MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COKED COAL/INTRUSION	162	+32	11
GLENDOO SST MEMBER	234	-40	25
COAL; BOWEN SEAM	312	-118	5
COAL; BLAKE SEAM	361	-167	9.6

Tectonic Structure:
Remarks BOTTOM OF HOLE IS AT BDARY BETWEEN COLLINSVILLE CM AND LIZZIE CK VOLCANICS. THINNER COAL SEAMS ALSO PRESENT

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:381 Base Elevation: -187 Thickness: 231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:381 Base Elevation: -187 Thickness: 381
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONSISTS OF BLENHEIM SUB-GP AND COLLINGVILLE GN OF GEBBIE SUB-GP

STRATIGRAPHY: LIZZIE CREEK V'OLC Age: PERMTAH Interpretation Code:Yi85
Basal Information: Depth to Base:TD Base Elevation: -188# Thickness:)1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BLENHEIM CREEK RJ4

REFERENCE # B12

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-7	21 04'33"S	148 13'21"E	+250	+250	-454 ?	704 ?	

REFERENCE: MALONE, E.J., JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE SOUTHERN HALF OF THE BOWEN 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 100 Page 37-39;PL.6 Pubin Year: 1966

Cross Reference: MALONE ET AL. 1964 BMR REPORT NO.64, 24,PL 1,3

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -454 ± Thickness: >704?
Geologic Description: THIN-BDD MICAC SLTST, C-F QZ SST, FELSIC SILLS, AND BLOCKY BDD GREY SLTST - F SILTY SST WITH PEBBLES; MARINE FOSSILS
Reported Environment: MARINE MODERATELY DEEP WATER (MALONE ET AL. 1964)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: BDS STEEPLY DIPPING TO NE AND OVERTURNED
Remarks TOTAL DEPTH VERY APPROXIMATE DUE TO COMPLEX STRUCTURE.(PROBABLY DEEPER).LOCATION IS TYPE SECTION

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -454 ± Thickness: >704
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED BLENHEIM SUB-GROUP

CONTROL POINT: BOOROONDARA 27/3

REFERENCE # B60

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-11	22 58'53"S	148 29'42"E	+220	+220	+193	27	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page PL 13; 37 Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +193 ± Thickness: >27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y1B1
Basal Information: Depth to Base:TD Base Elevation: +193 ± Thickness: >27
Geologic Description: F-C ARENITE (OCCASIONALLY CARB AND/OR MICAC)WITH SLTST (OCCASIONALLY CARB), MINOR CGL (METAM PBL), AND COAL. ARENITE.THIN BED.
Reported Environment: FRESHWATER, SLOWLY SUBSIDING BASIN.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CONGLOMERATE	16	+204	1
COAL	17	+203	<1
COAL	18	+202	<1

Tectonic Structure:
Remarks

CONTROL POINT: BOWEN RIVER RJ7

REFERENCE # 813

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-7	21 06'47"S	148 12'48"E	+250	+250	-865	1117	

REFERENCE: MALONE, E.J., CORBETT, D.W.P., AND JENSEN, A.R.
GEOLOGY OF THE MOUNT COGLON 1:250,000 SHEET AREA
BUREAU OF MINERAL RESOURCES REPORT NO. 64 Page 31, PL 1,4 Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -865 # Thickness: >915?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -865 # Thickness: >915?
Geologic Description: THIN-BDD BROWN SLTST, C-M GRAINED BROWN GWKE, COBBLE CGL, INTERMEDIATE INTRUSIVES, MINOR CHERT AND SHALE; FOSSIL PLANTS AND WOOD
Reported Environment: RAPIDLY SINKING RESTRICTED BASIN; FRESHWATER OR AT LEAST ESTUARINE; SOMEMARINE INFLUENCE; OCCASIONALLY SWAMPY.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 35-90 DG
Remarks SECTION PROJECTED BELOW TOP OF SECTION. BASE ELEVATIONS (TD) DETERMINED BY CALCULATING APPARENT THICKNESS FOR 35 DG DIP

CONTROL POINT: CAIRNS COUNTY NS 10

REFERENCE # 846

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED, WIRELINE	SF/55-11	22 21'02"S	148 19'02"E	+185	+186	-208	394	

REFERENCE: HOLMES, P.R.
DEEP COAL RESOURCE DRILLING PEAK DOWNS - NORWICH PARK AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/50 Page Publn Year: 1980

Cross Reference: JENSEN, A.R. 1975, BMR BULLETIN 154, 138. STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD GOVT MINING JOURNAL, 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:102 Base Elevation: +84 Thickness:)101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -208 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -208 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:102 Base Elevation: +84 Thickness: 101
Geologic Description: ARENITE WITH MUDSTONE, CLAYSTONE, SILTSTONE, ABUNDANT TUFFS AND DIRTY COAL SEAMS; CROSS-BEDDING; FOSSIL WOOD AND PLANTS
Reported Environment: CONTINENTAL (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
GOSSOP.-GANGAHOP.	23	+163	
COAL: S UPPER SEAM	74	+112	12
COAL: S LOWER SEAM	105	+81	6

Tectonic Structure: DIPS AT 5 DG
Remarks

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:211 Base Elevation: -25 Thickness: 13
Geologic Description: SUB-LABILE TO QUARTZOSE FINE GRAINED ARENITE AND SILTSTONE; CARBONACEOUS IN PARTS; WORM BURROWS
Reported Environment: NEAR-SHORE; DELTA COMPLEX SUBJECTED TO DELTA SWITCHING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks MACMILLAN FM OCCURS AS A TONGUE IN THE MIDDLE OF THE MORANBAH CM

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:391 Base Elevation: -285 Thickness: 276
Geologic Description: LABILE SST, SLTST, MDST, COAL SEAMS AND IGNEOUS INTRUSIVES; CROSS-BEDDED, THINLY BEDDED, SOME SLUMPING; PLANT FOSSILS AND WORM BURROWS
Reported Environment: FLUVIAL FLOODPLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INT: Q SEAMS(2)	187	-1	16
COAL: P SEAM	218	-32	1.5
COAL: HARROW CK SEAM	241	-55	5
COAL: DYSART SEAM	391	-205	6.4

Tectonic Structure: DIPS VARY FROM 2 TO 14 DG
Remarks A NUMBER OF OTHER SEAMS ALSO PRESENT. MACMILLAN FM OCCURS AS A TONGUE IN MIDDLE OF MORANBAH CM

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:571 Base Elevation: -205 Thickness: 377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS FORT COOPER AND MORANBAH CM

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -208 * Thickness: >3
Geologic Description: GREY SHALE AND SILTSTONE AND VERY FINE QUARTZ SANDSTONE; PLANT FOSSILS
Reported Environment: PARALIC (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure: DIPS 12 DG
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -209 * Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -208 * Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS OF BLENHEIM SUB-GP

CONTROL POINT: CAIRNS COUNTY NS 11

REFERENCE # B44

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 20'02"S	148 20'46"E	+179	+180	-318	498	

REFERENCE: HOLMES, P.R.
DEEP COAL RESOURCE DRILLING PEAK DOWNS - NORWICH PARK AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1988/50 Page Publn Year: 1988
Cross Reference: JENSEN, A.R. 1975, BMR BULLETIN 154, 138-139

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:145 Base Elevation: +35 Thickness:)144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIASN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -310 ± Thickness:)210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -310 ± Thickness:)345
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:145 Base Elevation: +35 Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:280 Base Elevation: -100 Thickness: 135?
Geologic Description: L1 GY-GY LABILE FINE GRAINED ARENITE, SILTSTONE, SHALE, MUDSTONE AND COAL SEAMS; CROSS-BEDDED, LAMINATED; PLANT FOSSILS
Reported Environment: FLOOD-PLAIN LAKES (FRESHWATER) (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: LEICHHARDT SM	178	+2	3
COAL: VERMONT SEAM	280	-20	2.5

Tectonic Structure: DIPS 3-15 DG; FRACTURED,SLICKED,FAULTED
Remarks FAULT AT 228 M (-48 MSL) - BRECCIA AND 80 DG DIP

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: TD Base Elevation: -310 ± Thickness: >210
Geologic Description: LABILE ARENITE, MUDSTONE, SILTSTONE, COAL (WITH TFAC INTBDS); CARB IN PLACES; CALC PATCHES; CROSS-BEDDING, SOME SLUMPING; PLANT FOSSILS
Reported Environment: CONTINENTAL (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, TUFF INTERVAL	308	-128	24
COAL INTERVAL	346	-166	7
COAL INTERVAL	418	-238	10
INTRUSIVE	448	-268	10

Tectonic Structure: DIPS 7-8 DG
Remarks: COAL INTERVAL AT 369 M (-189 MSL, 6 M THICK)

STRATIGRAPHY: PLACKWATER GP Age: PERMIAN Interpretation Code: Y104
Basal Information: Depth to Base: TD Base Elevation: -310 ± Thickness: >345
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS RANGAL AND FORT COOPER CM

CONTROL POINT: CAIRNS COUNTY NS 13

REFERENCE # B39

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 09'03"S	148 09'29"E	+218	+219	-322	541	

REFERENCE: HOLMES, P.R
DEEP COAL RESOURCE DRILLING PEAK DOWNS - NORWICH PARK AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1980/50 Page Publn Year: 1980

Cross Reference: JENSEN, A.R. 1975, BMR BULLETIN 154, 138
LD GOVT MINING JOURNAL, 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:220 Base Elevation: -1 Thickness:)219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -322 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:220 Base Elevation: -1 Thickness: 219
Geologic Description: FINE-COARSE ARENITE, MUDSTONE, SILTSTONE, CARBONACEOUS SHALE, COAL, TUFF, MINOR CGL; FOSSIL PLANTS AND LOGS; ORGANIC BURROWS
Reported Environment: CONTINENTAL (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	83	+136	4.2
COAL INTERVAL	163	+56	37
COAL AND TUFF	185	+34	11
COAL	220	-1	3

Tectonic Structure: DIPS 3 DG
Remarks COAL/TUFF AT 38 M (+181 MSL, 8 M THICK); COAL AT 198 M (+21 MSL, 1.6 M THICK)

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:521 Base Elevation: -302 Thickness: 301
Geologic Description: SILTSTONE, ARENITE, MUDSTONE, SHALE (CARB IN PARTS), COAL SEAMS; XBDD, FINELY LAMINATED; PLANT FOSSILS, SOME WORM BURROWS
Reported Environment: FLUVIAL FLOOD PLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL; P SEAM	320	-101	5.4
COAL; HARROW CK SEAM	362	-143	4.7
HARROW CK LOWER 2 SM	407	-188	7
COAL; DYSART SEAM	484	-265	7

Tectonic Structure: FRACTURED IN PARTS; DIPS 2-10 DG
Remarks R SM AT 254 M (-35 MSL, 2.4 M THICK); Q SM AT 269 M (-50 MSL, 1 M THICK); DYSART UPPER SM AT 443 M (-224 MSL, 3.6 M TH)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:521 Base Elevation: -302 Thickness: 520

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF FORT COOPER AND MORANBAH CM

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -322 ft Thickness: >20
Geologic Description: QZ ARENITE, SILTSTONE AND MUDSTONE; MICACEOUS; ARENITE IS CROSS-BEDDED AND SILTSTONE AND MUDSTONE LAMINATED
Reported Environment: PARALIC (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 3 DG
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -322 ft Thickness: >20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF GERMAN CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -322 ft Thickness: >20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GERMAN CREEK FM OF BLENHEIM SUB-GROUP

CONTROL POINT: CAIRNS COUNTY NS 16

REFERENCE # B38

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 07'20"S	148 12'40"E	202	203	-27	230	

REFERENCE: KOPPE, W.H , AND SCOTT, S.G.
RECONNAISSANCE DRILLING IN THE NORTHERN BOWEN BASIN - RED HILL, BROADMEADOW AND WINCHESTER
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/31 Page FIG. 12 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:90 Base Elevation: +113 Thickness:)83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -27 * Thickness: 778
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -27 * Thickness:)140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:7 Base Elevation: 196 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:90 Base Elevation: 113 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 4 DG DIP
Remarks NO THICKNESS CORRECTION

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:152 Base Elevation: 51 Thickness: 62

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 2-7 DG DIP
Remarks NO THICKNESS CORRECTION

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -27# Thickness:)78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -27# Thickness:)140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CAIRNS COUNTY NS 227

REFERENCE # B48

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE +WIRLINE	SF/55-11	22 24'55"S	148 24'05"E	+187	+187	+4	183	

REFERENCE: SORBY, L.A.
COAL EXPLORATION NORTH CENTRAL BOWEN BASIN LAKE VERMONT AREA - BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/12 Page FIG 3 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:41 Base Elevation: +146 Thickness:)14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +4 * Thickness:)72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +4 * Thickness:)142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:27 Base Elevation: +160 Thickness: 27
Geologic Description: WH LT-GY RED AND YEL CLAYSTONE; WH SANDSTONE, F-M, POORLY SORTED, QUARTZOSE, ARG; SOFT, LATERIZED, IRON STAINED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:41 Base Elevation: +146 Thickness: 14
Geologic Description: MUDSTONE SILTSTONE SANDSTONE; LT-BN YEL-BN BN GY-GN; WEATHERED; MICAC; SST IS VF-M, M-WELL SORTED, LABILE, ARG
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:111 Base Elevation: +76 Thickness: 70

Geologic Description: MDST SLTST AND COAL; BASAL SST; MDST-SLTST IS INTBDD, LT-DK GY WITH SOME F SST INTBDS, PLANT FOSS; COAL THICK; SST M GRAINED WITH MDST CLASTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, LEICHHARDT SM	70	+117	3
COAL, VERMONT SM	94	+93	6

Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +4 ft Thickness: >72
Geologic Description: SLTST, MDST, CARB MDST, SST, COAL; LT-DK GY, THIN-THICKLY INTBDD-LAMD; SST VF-M, LABILE; TFAC, CARB, PLANT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, GIRRAH SM	179	+8	17

Tectonic Structure: SLICKENSIDES, FRACTURES, 3 DG DIP
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +4 ft Thickness: >142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL CM AND FORT COOPER CM

CONTROL POINT: CAIRNS COUNTY NS 67

REFERENCE # B52

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 40'32"S	148 30'27"E	+197	+198	-260	458	

REFERENCE: HOLMES, P.R.
DEEP COAL RESOURCE DRILLING PEAK DOWNS - NORWICH PARK AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1980/50 Page Publn Year: 1980

Cross Reference: JENSEN AR 1975 BMR BULLETIN 154, 138 STAINES HRE AND KOPPE WH 1979 QLD GOVT M
INING JOURNAL 80, 188

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:125 Base Elevation: +74 Thickness:)124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -260 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:125 Base Elevation: +74 Thickness: 124
Geologic Description: CARB AND TFAC MDST,SST, SLTST, AND MDST WITH MINOR COAL; IRREGULARLY INTBDD; MINOR BIOTURBATION
Reported Environment: CONTINENTAL ENVIRONMENT (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL AND CARB SEQ	80	+118	34
COAL	124	+74	2

Tectonic Structure: FRACTURED, SLICKENSIDES; 4 DG DIP (BASE)
Remarks

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:267 Base Elevation: -69 Thickness: 142
Geologic Description: VF-C SST WITH SLTST AND MDST; SOME SLUMPING; ORG DISTURBANCE; BRACHIOPODS
Reported Environment: NEAR SHORE. DELTAIC COMPLEX SUBJECTED TO DELTA SWITCHING.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BRACHIOPODS	207	-9	

Tectonic Structure:
Remarks

STRATIGRAPHY: MOKAMBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:353 Base Elevation: -155 Thickness: 86
Geologic Description: SST, SLTST, MDST (CARB IN PLACES), COAL, TUFF, AND INTRUSIVE
Reported Environment: FLUVIAL FLOOD-PLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE + CKD COAL	271	-73	2

	COAL	286	-88	1
	COAL	303	-105	2
	COAL	313	-115	1

Tectonic Structure: DIPS 10-12 DG
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:353 Base Elevation: -155 Thickness: 352
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS FORT COOPER CM, MACMILLAN FM, AND MORANBAH CM.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -260 ± Thickness: >105
Geologic Description: VF-M SST, SLTST, MDST, AND SHALE WITH COAL SEAMS; INTBDD; PLANT FOSSILS
Reported Environment: PARALIC (STAINES AND KOPPE, 1979)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, HARROW CK SM	365	-167	4.6
	COAL, DYSART RIDER	415	-217	1
	COAL	431	-233	<1
	COAL, DYSART SM	438	-240	4.5

Tectonic Structure: DIP AT 6-7 DG.
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -260 ± Thickness: >105
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS GERMAN CREEK FM.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -260 ± Thickness: >105
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS GERMAN CREEK FM OF BLENHEIM SUB-GROUP

CONTROL POINT: CAIRNS COUNTY NS 69

REFERENCE # B49

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 30'05"S	148 23'09"E	+198	+199	-273	472	

REFERENCE: HOLMES, P.R.
DEEP COAL RESOURCE DRILLING PEAK DOWNS - NORWICH PARK AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1980/50 Page Publn Year: 1980
Cross Reference: JENSEN AR 1975 BMR BULLETIN 154, 138 STAINES HRE AND KOPPE WH 1979 QLD GOVT M
INING JOURNAL 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:149 Base Elevation: +50 Thickness:)148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -273 ± Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:149 Base Elevation: +50 Thickness: 148?
Geologic Description: MDST, TUFF, TFAC AND CARB MDST, COAL, SST, AND SLTST, IRREG INTBDG; LOWER SST XBDD; PLANT FOSS; SOME BIOTURBATION.
Reported Environment: CONTINENTAL (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	83	+116	(1
COAL	149	+50	7

Tectonic Structure: FRACTURED, SLICKENSIDES;VARIABLE DIPS
Remarks DIPS 45-70 DG BETWEEN 60 AND 72 M, ELSEWHERE LOW DIPS. THICKNESS UNCORRECTED

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:269 Base Elevation: -70 Thickness: 72
Geologic Description: LABILE LT GREY SST WITH DK GREY MDST AND SLTST; MASSIVE, OCCASIONAL XBDG, BIOTURBATED
Reported Environment: NEAR-SHORE. DELTA COMPLEX SUBJECT TO DELTA SWITCHING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MACMILLAN FM OCCURS AS A MARINE TONGUE WITHIN MORANBAH CM.

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:406 Base Elevation: -207 Thickness: 257
Geologic Description: SST WITH SH, SLTST, MDST, COAL, MINOR TUFF, INTRUSIVES, AND LST. GENERALLY MASSIVE WITH SOME INTLAM AND XBDG; PLANT FOSSILS.
Reported Environment: FLUVIAL FLOOD PLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, P1, P2 SMS((2)	285	-86	14
COAL, HARROW CK SM	343	-144	5.7

	COAL, J SM	363	-164	1.5
	COAL, DYSART SM	383	-189	2.6

Tectonic Structure: DIPS 1 TO 2 DG
Remarks: MACMILLAN FM OCCURS AS A TONGUE WITHIN THE MORANBAH CM; THICKNESS INCLUDES THE MACMILLAN. OTHER COAL SEAMS PRESENT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:406 Base Elevation: -287 Thickness: 405
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS FORT COOPER FM, MACMILLAN FM, AND MORANBAH CM.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -273 * Thickness:)66
Geologic Description: SST, %DST, AND SLTST, MINOR COAL; IRREGULARLY INTBDD AND SOME XBDG
Reported Environment: PARALIC (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	444	-245	(1

Tectonic Structure:
Remarks:

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -273 * Thickness:)66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES GERMAN CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -273 * Thickness:)66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS GERMAN CREEK FM OF BLENHEIM SUB-GR.

CONTROL POINT: CAIRNS COUNTY NS 7

REFERENCE # 847

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 21'53"S	148 18'25"E	+189	+198	-177	367	

REFERENCE: HOLMES, P.R.
DEEP COAL RESOURCE DRILLING PEAK DOWNS - NORWICH PARK AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1988/50 Page Publn Year: 1988

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD GOVT MINING JOURNAL, 80, 180 // DICKIN S, J.M. AND MALONE, E.J. 1973, BMR BULLETIN 130, 122

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -177 # Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:230 Base Elevation: -40 Thickness: 229
Geologic Description: LABILE SST WITH MUDSTONE, SILTSTONE AND THICK LOW-ASH COAL SEAMS; CROSS-BEDDING; IRON CARBONATE NODULES; ORGANIC BURROWS, PLANT FOSSILS
Reported Environment: FLUVIAL FLOODPLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: P1 SEAM	55	+135	1.3
COAL: P2 SEAM	73	+117	1.8
HARROW CK LOWER- CKD	109	+81	2
COAL: DYSART SEAM	230	-40	7.4

Tectonic Structure: DIPS 2-9 DG
Remarks COAL AT 140 M (+50 MSL, 2 M THICK); COAL AT 174 M (+16 MSL, (1 M THICK)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:230 Base Elevation: -40 Thickness: 229
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MORANBAH CM

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -177 # Thickness:)137
Geologic Description: QZ-RICH SST WITH SILTSTONE, MUDSTONE AND COAL; MICAC IN PLACES; ACCAS PYRITIC; CROSS-BEDDING; ORGANIC BURROWS, PLANT FOSSILS
Reported Environment: PARALIC (STAINES AND KOPPE, 1979); DELTAIC (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	262	-72	(1
COAL	270	-80	(1
COAL	282	-92	1.5
COAL	291	-101	1

Tectonic Structure: DIPS 3-6 DG
Remarks COAL AT 247 M (-57 MSL, (1 M THICK)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -177 # Thickness:)137

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GERMAN CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN , Interpretation Code:Y185
Basal Information: Depth to Base:TD Base Elevation: -177 ± Thickness: >137
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GERMAN CREEK FM OF BLENHEIM SUB-GROUP

CONTROL POINT: CAIRNS COUNTY NS 95

REFERENCE # B43

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 13'15"S	148 18'07"E	+213	+213	+134	79	

REFERENCE: CARR, A.F.
COAL EXPLORATION WINCHESTER SOUTH AREA - NORTH BOWEN BASIN BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1980/28 Page Publn Year: 1980
Cross Reference: JENSEN AR 1975 BMR BULLETIN 154, 138-139

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:32 Base Elevation: +181 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +134 # Thickness:)6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +134 # Thickness:)47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:32 Base Elevation: +181 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:73 Base Elevation: +140 Thickness: 41
Geologic Description: MDST, LABILE SST, SH, AND SLTST WITH COAL SEAMS; INTLAM, INTBDD; MINOR SLUMPING; PLANT FOSSILS.
Reported Environment: FLOOD PLAIN FRESHWATER LAKES (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY MDST	33	+180	(1
COAL, LETCHHARDT SM	59	+163	4
COAL, VERMONT SM	73	+148	2

Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +134 ± Thickness:)6
Geologic Description: LABILE SILTY SANDSTONE AND COAL SEAM
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, VERMONT SM 77 +136 3.2
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +134 ± Thickness:)47
Geologic Description:
Reported Environment: CONTINENTAL (JENSEN, 1975)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL AND FORT COOPER COAL MEASURES.

CONTROL POINT: CAIRNS COUNTY NS 99

REFERENCE # B51

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, WIRELINE	SF/55-12	22 38'00"S	148 31'14"E	+185	+185	+142	43	

REFERENCE: KOPPE, W.H.
RECONNAISSANCE COAL EXPLORATION IN THE NORTH BOWEN BASIN WINCHESTER SOUTH AND SCOTT CREEK
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/39 Page Publn Year: 1979

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +142 * Thickness:)43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +142 * Thickness:)43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Fratcre Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +142 * Thickness:)43
Geologic Description: INTERBEDDED BROWN TUFFACEOUS MUDSTONE AND COAL; COAL IS INFERIOR IN QUALITY WITH HIGH ASH CONTENT
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	39.5	+224.5	5.5
COAL	42.5	+142.5	1

Tectonic Structure:
Remarks AXIS OF SHALLOW SYNCLINE PASSES CLOSE TO THIS DRILL-HOLE

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +142 * Thickness:)43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF FORT COOPER CM

CONTROL POINT: CHERWELL BORE

REFERENCE # B41 Y1
REFERENCE # B41 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
BUR. MIN. RES.	BORE	SF/55-11	22 19'36"S	147 58'21"E	+340 ?	+340 ?	+201	139	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page 22,43;PL13 Publn Year: 1964
Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD. GOVT MINING JOURNAL, 80, 179

REFERENCE: X1
THIS REPORT Page Publn Year:
Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 240 M. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:100 Base Elevation: +240 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GP AND COLLINSVILLE CM OF GEBBIE SUB-GP

STRATIGRAPHY: BASEMENT VOLCANICS Age: ? Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: +201 ± Thickness:)1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 121
Geologic Description: BLUE AND GREY ARENITE WITH BLME SHALE AND COAL BANDS
Reported Environment: NON-MARINE FACIES OF A DELTA SYSTEM (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 100 +249 1
COAL 110 +230 3
Tectonic Structure:
Remarks OVERLAIN BY 17 M OF ALLUVIUM

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:138 Base Elevation: +202 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM OF GEBBIE SUB-GP

STRATIGRAPHY: UNDIFF LOWER CARB Age: EARLY CARB Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +201 ± Thickness:)1
Geologic Description: DARK VOLCANIC ROCK
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CHERWELL CREEK

REFERENCE # B48

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BMR. MIN. RES.	SECTION	SF/55-11	22 13'39"S	147 58'33"E	+300 ?	+300 ?	+241	59	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page 29,32;PL12 Publn Year: 1964
Cross Reference: OLGERS, F. 1969, CLERMONT 1:250,000 EXPLANATORY NOTES SF/55-11, MAP

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +241 # Thickness:)59
Geologic Description: MICAC SLTST, GREYWACKE AND FINE QZ SST GRADE INTO M QZ SST AND SLTST; MARINE FOSSILS IN LOWER PART; PLANTS AND TRACES OF WOOD AT BASE
Reported Environment: PARALIC (MARINE TO FRESHWATER); NEAR-SHORE OR LAGOONAL WITH SOME SEAWARDCONNECTION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BRACHS, GASTROPODS	35	+265	
GASTROPOD, PELECYPOD	58	+242	

Tectonic Structure: LOW DIP
Remarks UNDIFFERENTIATED BLENHEIM SUB-GP

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +241 # Thickness:)59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONSISTS OF UNDIFFERENTIATED BLENHEIM SUB-GP

CONTROL POINT: DMC DDH 10

REFERENCE # B56

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DAMPIER MIN. CO.	DDH	SF/55-11	22 46'24"S	147 38'31"E	+260	+260	+55	205	

REFERENCE: COOK, F.W., AND TAYLOR, C.P.
PERMIAN STRATA OF THE WOLFGANG BASIN
QUEENSLAND GOVERNMENT MINING JOURNAL, 80 Page 344-346 Publn Year: 1979

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:7 Base Elevation: +253 Thickness: 7
Geologic Description: BASALT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +55 # Thickness: >198
Geologic Description: UPPER UNIT CONTAINS 5 M OF MASS KAOLINITIC SST; MIDDLE UNIT- GWKE, LST,MARL, SST, CGL; LOWER UNIT SIMILAR TO UPPER. MARINE FOSSILS IN MARL
Reported Environment: UPPER AND LOWER UNITS FRESHWATER; MIDDLE UNIT MARINE.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MARINE UNIT	117	+143	53

Tectonic Structure:
Remarks: MARINE UNIT CORRELATIVE OF CLARKE' BD CONTAINS WYNDHAMIA CLARKEI PELECYPODS, GASTROPODS, BRYOZOA, WORM BURROWS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +55 # Thickness: >198
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: LATE PERMIAN SEQUENCE DESCRIBED IS POSSIBLY BACK CREEK GROUP.

CONTROL POINT: DRAKE NS 10

REFERENCE # B21 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 21'54"S	147 53'06"E	+292	+293	-113	406	*

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2, ENC 2 Publn Year: 1979

Cross Reference: STAINES H.R.E. AND KOPPE W.H. 1979, QLD. GOVT MINING JOURNAL 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:92 Base Elevation: +201 Thickness: 91
Geologic Description: CARB SHALE, MUDSTONE, TUFFACEOUS MUDSTONE, TUFF, LITHIC SANDSTONE AND COAL
Reported Environment: CONTINENTAL. FLUVIAL; MARGINAL VOLCANIC ACTIVITY (STAINES + KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	25	+268	3
TUFF	40	+255	2
COAL	52	+241	1
COAL	56	+237	2

Tectonic Structure: DIPS 10 DG
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -113 * Thickness: >314?
Geologic Description: LITHIC-LAB OR SUBLAB SST, SLTST, SHALE, CARB SHALE, INTRUSIVES, AND COAL (SOME COKED); MICAC TOWARDS BASE; PLANT FOSSILS
Reported Environment: CONTINENTAL. FLUVIAL FLOODPLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL;GOONYELLA UPPER	151	+142	6
COAL; 'P' SEAM	198	+95	4
COAL/CKD COAL/INTRUS	269	+24	9
INTRUSIVE/COKED COAL	304	-11	9

Tectonic Structure: DIPS VARY WIDELY FROM 12 TO 42 DG
Remarks OTHER, SMALLER COAL SEAMS PRESENT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -113 * Thickness: >405
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS FORT COOPER AND MORANBAH CM

CONTROL POINT: DRAKE NS 12,12A

REFERENCE # B21 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 20'51"S	147 56'24"E	+317	+318	-139	457	#Z

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -N RTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2, ENC 2 Publn Year: 1979

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QMJ 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:160 Base Elevation: +158 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:237 Base Elevation: +81 Thickness: 77
Geologic Description: GY SILTSTONE, F-M LITHIC ARENITE, SH, COAL, CARB SH, MINOR LIMESTONE AND AN INTRUSIVE; ARENITE CROSS-BEDDED; PLANT FOSSILS
Reported Environment: CONTINENTAL. FLUVIAL (STAINES + KOPPE 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL;LEICHHARDT SM	180	+138	4
INTRUSIVE	189	+129	6
COAL;VERMONT-GIRRAH	237	+81	1

Tectonic Structure: DIPS 7-10 DG
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -139 # Thickness: >220
Geologic Description: LITHIC ARENITE, SILTSTONE, MUDSTONE, COAL, SHALE, CARB SHALE, TUFF AND MINOR CONGLOMERATE
Reported Environment: CONTINENTAL. FLUVIAL (STAINES + KOPPE 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	256	+62	20
TUFF/COAL	266	+52	8
COAL/CARB SHALE	328	-10	10
TUFF/COAL	385	-67	10

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -139 # Thickness: >297
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS RANGAL AND FORT COOPER CM

CONTROL POINT: DRAKE NS 19

REFERENCE # B3

Organisation	Type	Magno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	GF/55-3	29 41'46"S	147 50'45"E	165	165	-204	369	

REFERENCE: X1 KOPPE, W.H.
DEPARTMENTAL RECONNAISSANCE DRILLING NORTHWEST BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/7 Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:272 Base Elevation: -107 Thickness: 272
Geologic Description: SST MDST SLTST, COAL & CARB SH, INTRUSIVES, SOME TUFF. MASSIVE, POORLY LAMD, CARB, TFAC, MICAC, PLANT REMAINS, TRACE FOSSILS. SLUMPS, BRECCIA
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF & COAL- "P" SM	24	141	3
COAL, GOONYELLA M.	101	64	2
COAL, GOONYELLA L.	258	-93	6
INTRUSIVES	T'OUT		

Tectonic Structure: 2-10 DG DIPS. BRECCIA, SLICKS
Remarks BLACKWATER GP. COALS ARE COMMONLY COKED

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:272 Base Elevation: -107 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -204# Thickness:)97
Geologic Description: INTBDD SST MDST SLTST, INTRUSIVES, THIN COAL AT TOP. LAMD, BIOTURB. WHITE MICA, CARB FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE (SILL)	325	-161	1.5
INTRUSIVE (SILL)	351	-185	1.5

Tectonic Structure: 4-7 DG DIPS
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -204# Thickness:)97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS EXMOOR FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -204# Thickness:)97
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EXMOOR FM

CONTROL POINT: DRAKE NS 2

REFERENCE # B19

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-7	21 05'59"S	147 54'49"E	220	220	-100	320	

REFERENCE: X1 KOPPE, W.H.
DEPARTMENTAL RECONNAISSANCE DRILLING NORTHWEST BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/7 Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -100 * Thickness: >320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -100 * Thickness: >320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:320 Base Elevation: -100 Thickness: 320*
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOCATION, ELEVATION, AND BASE ELEVATION ARE APPROXIMATE

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:320 Base Elevation: -100 Thickness: 320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOCATION, ELEVATION, AND BASE ELEVATION ARE APPROXIMATE

CONTROL POINT: DRAKE NS 20

REFERENCE # 89

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-3	20 57'43"S	147 46'41"E	210	210	-172	382	

REFERENCE: X1 KOPPE, W.H.
DEPARTMENTAL RECONNAISSANCE DRILLING NORTHWEST BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/7 Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:178 Base Elevation: 32 Thickness: 178?
Geologic Description: INTBDD SST,SLTST,MDST,CAPB SH,COAL,INTRUSIVES,INTRAFM CGL. LAMD, LITHIC, MICAC, CARB FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, "P" SEAM	29	181	7
COAL, GOONYELLA M.	65	145	6.7
COAL, GOONYELLA L.	165	45	6.32
INTRUSIVES (SILLS)	T'OUT		

Tectonic Structure: DIPS 5-15 DG. FRACTURED, BRECCIATED
Remarks COAL OF POOR QUALITY

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:178 Base Elevation: 32 Thickness: 178
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:283 Base Elevation: -73 Thickness: 105
Geologic Description: INTDBB SLTST, SST, MDST, MINOR COAL AND INTRUSIVES. LAMD, BIOTURB. QTZOSE TO SUB-LITH, WH MICA, CARB FRAG. BRACHIOPODS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL (COKED) & SILL	188	22	2.4
INTRUSIVE (SILL)	201	9	1.2

Tectonic Structure:
Remarks DIPS 4-9 DG.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:321 Base Elevation: -111 Thickness: 38
Geologic Description: INTBDD SLTST, SST, MDST; INTRUSIVE. LAMD, BIOTURB, MASSIVE.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE (SILL)	297	-87	3.7

Tectonic Structure: 3 DG DIP
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:321 Base Elevation: -111 Thickness: 143
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EXMOOR FM AND GERMAN CREEK FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:374 Base Elevation: -164 Thickness: 53
Geologic Description: SANDY SLTST WITH SANDSTONE AND SILTY MDST. BIOTURB, PEBBLES, COBBLES, SHELL FRAGMENTS, TFAC.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:374 Base Elevation: -164 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INGELARA FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -172± Thickness: >204
Geologic Description: BOTTOM 8M: BIOTURB QZTOSE SANDSTONE AND PETROMICT PEBBLE AND COBBLE CGL.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EXMOOR, GERMAN CREEK, INGELARA FMS. BOTTOM 8M UNDIFFERENTIATED.

CONTROL POINT: DRAKE NS 24R

REFERENCE # 820

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	IDH, CORE + WIRELINE	SF/55-7	21°13'34"S	147°50'14"E	290	290	-56	346	

REFERENCE: X1 KOPPE, W.H.
DEPARTMENTAL RECONNAISSANCE DRILLING NORTHWEST BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/7 Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BASALT Age: Interpretation Code:X101
Basal Information: Depth to Base:66 Base Elevation: 224 Thickness: 66
Geologic Description: GREEN-GREY TO BLACK, VESICULAR
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
DIATOMITE AND MDST	34	256	6

Tectonic Structure:
Remarks

STRATIGRAPHY: EXEVALE FM Age: CAINOZOIC Interpretation Code:X102
Basal Information: Depth to Base:87 Base Elevation: 203 Thickness: 21
Geologic Description: VF-F SANDSTONE, MUDSTONE, SHALE. POORLY CONSOLIDATED, FISSILE, CARB PARTINGS, TFAC
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure: DIPS 6-11 DG
Remarks: UNCONFORMABLE ON MORANBAH CM.

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:198 Base Elevation: 92 Thickness: (111?
Geologic Description: M-C SST AND INTBDD SLTST, MDST, F SST, COAL. MASS, LAMD-XLAMD, MICAC; CALC, CARB FRAG, PLANT FOSSILS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, COKED	129	161	4
INTRUSIVE + COAL	129	161	4
LIMESTONE	136	154	(1
COAL, GOONYELLA L.	195	95	6.48

Tectonic Structure: DIPS 7-13 DG. FAULTED 143-144M DEPTH
Remarks: UNCONFORMITY AT TOP. THICKNESS NOT CORRECTED (AUG 10 DG DIP) DUE TO UNCERTAIN DEGREE OF FAULTING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:298 Base Elevation: 92 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MORANBAH CM. UNCONFORMITY AT TOP

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:283 Base Elevation: 7 Thickness: (85?
Geologic Description: F-M SST, MDST, SH, SLTST, COAL. MASS, INTBDD, LAMD-XLAMD, BIOTURB, TFAC, CARB FRAG, MICAC, BURROWS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

	COAL	213	77	2
	COAL	233	57	1
	INTRUSIVE SILL	235	55	1
	FAULT AND BRECCIA	275	15	1

Tectonic Structure: 5-30 DG DIPS. BRECCIA AND REVERSE FAULT
Remarks: 8.2M DISPLACEMENT RECORDED FOR REVERSE FUALT. THICKNESS NOT CORRECTED

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X186
Basal Information: Depth to Base:TD Base Elevation: -56% Thickness:)63
Geologic Description: F-C SST, CGL, SLTST, INTRUSIVES. MASSIVE, INTBDD, LAMD, XLAMD, BIOTURB, CARB, SCATTERED PEBBLES, ORGANIC TRAILS
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	INTRUSIVE SILL	293	-3	2
	INTRUSIVE SILL	306	-16	4

Tectonic Structure: 9-10 DG DIPS
Remarks: THICKNESS NOT CORRECTED

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -56% Thickness:)148
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: GERMAN CREEK FM AND EXMOOR FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -56% Thickness:)148
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: GERMAN CREEK AND EXMOOR FM

CONTROL POINT: DRAKE NS 7

REFERENCE # B21 1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 21'55"S	147 54'47"E	+298	+291	-146	437	E

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2, ENC 2 Publn Year: 1979
Cross Reference: STAINES H.R.E. AND KOPPE W.H. 1979, QLD. GOVT MINING JOURNAL 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:41 Base Elevation: +250 Thickness: 40
Geologic Description: WHITE ARENITE WITH COAL SEAM AT BASE
Reported Environment: CONTINENTAL. FLUVIAL (STAINES + KOPPE, 1979)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL;LEICH.-VERM. SM	41	+250	7

Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:401 Base Elevation: -110 Thickness: 360
Geologic Description: LITHIC ARENITE, CARB SH, MUDSTONE, COAL, TUFF AND SILTSTONE; ARENITE CALC IN PARTS; CARB FRAGMENTS; PLANT FOSSILS
Reported Environment: CONTINENTAL. FLUVIAL (STAINES + KOPPE, 1979)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL; GIRRAH SEAM	54	+237	4
	COAL	92	+199	2
	COAL, VERMONT-GIRRAH	154	+137	12
	COAL	401	-110	2

Tectonic Structure: DIPS 6-8 DG
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -146 E Thickness:)36
Geologic Description: SILTSTONE AND FINE GRAINED ARENITE; SILTSTONE LAMINATED, ARENITE CROSS-BEDDED
Reported Environment: CONTINENTAL. FLUVIAL (STAINES + KOPPE, 1979)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -146 E Thickness:)436
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL, FORT COOPER AND MORANBAH CM

CONTROL POINT: DRAKE NS 7,8,10,12

REFERENCE # B21

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 28'51"S	147 56'24"E	+317	+318	-900	1218	C

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -NORTH BOWEN BASIN BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2, ENC 2 Publn Year: 1979

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, GOVT MINING JOURNAL 80, 188
KOPPE, W.H. 1974, QLD GOVT MINING JOURNAL 75, 293

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:160 Base Elevation: +158 Thickness: >159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:597 Base Elevation: -279 Thickness: 360
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1130 Base Elevation: -812 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:160 Base Elevation: +158 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:237 Base Elevation: +81 Thickness: 77
Geologic Description: GREY SLTST, F-M LITHIC ARENITE, SH, COAL, CARB SH, INTRUSIVE, MINOR LST;ARENITE IS XBDD; CONTAINS PLANT FOSSILS.
Reported Environment: CONTINENTAL. (FLUVIAL - STAINES AND KOPPE 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, LEICHHARDT SM	180	+133	4
INTRUSIVE	189	+129	6
COAL, VERMONT-GIRRAH	237	+81	1

Tectonic Structure: DIPS 7-10 DEGREES

Remark: FOR COAL ANALYSIS SEE DRAKE NS 12, 12A.

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:597 Base Elevation: -279 Thickness: 366
Geologic Description: LITHIC ARENITE, CARB SH, MDST, COAL, TUFF, AND SLTST; ARENITE IS CALC IN PARTS; CARB FRAGMENTS; PLANT FOSSILS.
Reported Environment: CONTINENTAL. (FLUVIAL, MARGINAL VOLCANIC ACTIVITY - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, GIRRAH SM	250	+68	4
COAL	288	+30	2
COAL	350	-32	12
COAL	597	-279	2

Tectonic Structure: DIPS 6-8 DEGREES
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:911 Base Elevation: -593 Thickness: 314?
Geologic Description: GENERALLY LITHIC TO LABILE OR SUB-LAB SST, SLTST, SH, CARB SH, INTRUSIVES, COAL AND COKED COAL; MICAC TOWARDS BASE; PLANT FOSSILS.
Reported Environment: CONTINENTAL. (FLUVIAL FLOOD PLAIN - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, GOONYELLA SM	656	-338	6
COAL, 'P' SM,'P' TF	703	-385	4
COAL, GOONYELLA MID.	774	-456	9
INTRUSIVE, CKD COAL	809	-491	9

Tectonic Structure: DIPS VARY WIDELY FROM 12 TO 38 TO 42 DG.
Remarks GOONYELLA MIDDLE SM (774 M) CONTAINS COAL, COKED COAL, AND INTRUSIVES. INTRUSIVE ALSO AT 867 M(-549 MSL, 24 M THICK)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:911 Base Elevation: -593 Thickness: 751
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL, FORT COOPER, AND MORANBAH CM.

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1000 Base Elevation: -690 Thickness: 97
Geologic Description: SLTST, SH (SOME CARB), LITHIC AND SUB-LAB QZ ARENITE WITH INTRUSIVES AND COKED COAL; SLTST IS MICAC; ARENITE IS XBDD
Reported Environment: PARALIC. (VARIETY OF NEAR SHORE ENVIRONMENTS WITH DECLINING MARINE INFLUENCE - KOPPE, 1974)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE	962	-644	21
INTRUSIVE	987	-669	7
COKED COAL	990	-672	1

Tectonic Structure: DIPS 5-10 DG.
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1130 Base Elevation: -812 Thickness: 122
Geologic Description: INTBDD QZ ARENITE AND MICAC LAND SLTST; ORG BURROWS; BRACHIOPODS TOWARDS BASE.
Reported Environment: PARALIC OR MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure: DIPS 9-10 DG.
Remarks

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -900 ± Thickness: >88

Geologic Description: DK GREY SLTST AND FINE QZ ARENITE; ORGANIC BURROWS TOWARDS BASE AND MARINE FOSSILS THROUGHOUT.
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y117
Basal Information: Depth to Base:TD Base Elevation: -900 ft Thickness: >307
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EXMOOR, GERMAN CREEK, AND MARIA FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -900 ft Thickness: >307
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP (EXMOOR, GERMAN CK, MARIA FMS)

CONTROL POINT: DRAKE NS 8

REFERENCE # B21 0

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 21'47"S	147 52'04"E	+289	+298	-83	373	1

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2, ENC 2 Pubin Year: 1979

Cross Reference: STAINES H.R.E. AND KOPPE W.H. 1979, QLD. GOVT MINING JOURNAL 88, 180 // KOPPE W. H. 1974, QLD. GOVT MINING JOURNAL 75, 283

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:66 Base Elevation: +224 Thickness: 65
Geologic Description: FINE LITHIC ARENITE WITH MUDSTONE, MINOR SILTSTONE AND SHALE, AN INTRUSIVE AND COKED COAL
Reported Environment: CONTINENTAL. FLUVIAL FLOODPLAIN (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CKD COAL/INTRUSIVE	66	+224	13

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:66 Base Elevation: +224 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:163 Base Elevation: +127 Thickness: 97
Geologic Description: SLTST, SH, CARB SH, LITHIC, SUBLAB AND QZOSE ARENITE, INTRUSIVES AND COKED COAL; SLTST MICAC; ARENITE CROSS-BEDDED
Reported Environment: PARALIC. VARIETY OF NEARSHORE ENVIRONMENTS (DECL MING MARINE INFLUENCE) (KOPPE 1974)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE	117	+173	21
INTRUSIVE	142	+148	7
COKED COAL	147	+143	1

Tectonic Structure: DIPS 5-10 DG
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:285 Base Elevation: +5 Thickness: 122
Geologic Description: INTBDD QZ ARENITE AND MICACEOUS LAMINATED SILTSTONE; ORGANIC BURROWS, BRACHIOPODS TOWARDS BASE
Reported Environment: PARALIC OR MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure: DIPS 9-10 DEGS
Remarks

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -83 # Thickness: 388
Geologic Description: DARK GREY SILTSTONE AND FINE QZ ARENITE; ORGANIC BURROWS TOWARDS BASE AND MARINE FOSSILS THROUGHOUT
Reported Environment: MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -83 * Thickness:)307
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EXMOOR, GERMAN CREEK AND MARIA FMS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -83 * Thickness:)307
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GP AS ABOVE

CONTROL POINT: EXMOOR

REFERENCE # B11

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-3	20 56'43"S	148 07'55"E	+280	+280	-676	876	

REFERENCE: MALONE, E.J., JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE SOUTHERN HALF OF THE BOWEN 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 100 Page 32-39;PLS, Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y181
Basal Information: Depth to Base:271 Base Elevation: -71 Thickness: 222
Geologic Description: F SILTY SST FELD-LITHIC SST,MICAC CARB SLTST, INTBDD LITHIC SST AND SLTST, AND SANDY SILTY COQ (BIG STR ZONE). MICRODIORITE SILLS
Reported Environment: MARINE (NOT SHALLOW)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BIG STROPHALOSIA ZNE		+158	32
INTRUSIVES, SILLS			

Tectonic Structure: DIPS VARY FROM 32-36 DG.
Remarks: BASE ELEV FOUND USING AVG DIP OF 35 DG; SECTION PROJECTED UNDERNEATH YOUNGEST ROCKS IN SECTION (I.E. TOP OF BLENHEIM)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y182
Basal Information: Depth to Base:TD Base Elevation: -676 # Thickness: >449
Geologic Description: FELD-LITHIC QZOSE SST, BLUE-GREEN SLTST. F MICAC SST AND QZ SST; XBDD, RIPPLE MARK, WORM TRACKS
Reported Environment: FAIRLY SHALLOW MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
WALL SANDSTONE MB	635	-435	26

Tectonic Structure: DIPS VARY FROM 37-58 DG
Remarks: BASE ELEVATION FOUND USING AVG DIP OF 40 DG FOR ENTIRE SECTION.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y183
Basal Information: Depth to Base:TD Base Elevation: -676 # Thickness: >671
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BLENHEIM SUB-GR AND GEBBIE SUB-GR (UNDIFFERENTIATED)

CONTROL POINT: GEBBIE CREEK

REFERENCE # B4

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-3	20 44'23"S	147 56'57"E	+150	+150	-1872	2002	

REFERENCE: MALONE, E.J., JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE SOUTHERN HALF OF THE BOWEN 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 100 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:561 Base Elevation: -411 Thickness: 201
Geologic Description: M-C QZ GWKE (S'TIMES CARB OR CALC) WITH PEBBLES, COBBLES AND C SLTST; RICHLY FOSSILIF; INCLUDES BIG STROPALOSIA ZONE
Reported Environment: MARINE, NOT SHALLOW
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BIG STROPHALOSIA ZNE	91	+59	30

Tectonic Structure: DIPS 65-75 DG; AVG DIP 69 DG
Remarks BASE ELEVATION DETEMINED BY CALCULATING APPARENT THICKNESS AT 69 DG DIP. SECTION PROJECTED BENEATH YOUNGEST ROCKS

STRATIGRAPHY: CEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -1872# Thickness:)378
Geologic Description: M-F QZ GWKE INTBDD WITH C SLTST, GY SLTST, CARB SLTST, AND C QZ SST. GWKE AND SST LAM AND XLAM; FOSSILIF IN PLACES; WORM TRACKS
Reported Environment: FAIRLY SHALLOW MARINE, NEAR SHORE ENVIRONMENTS.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure: DIPS 69-85 DG; AVG DIP 75 DG
Remarks BASE ELEVATION DETERMINED BY CALCULATING APPARENT THICKNESS FOR 75 DG DIP

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -1872# Thickness:)579
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS UNDIFF BLENHEIM AND GEBBIE SUB-GROUPS

CONTROL POINT: GROSVENOR NS 1

REFERENCE # B22 D

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 31'24"S	147 55'54"E	+388	+388	-148	456	8

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -NORTH BOWEN BASIN BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page E,ENC 1,F9 Publn Year: 1979

Cross Reference: KOPPE, W.H. 1974 QLD GOVT MINING JOURNAL, 75, 283 / STAINES, H.R.E. AND KOPPE, W .H. 1979, QLD GOVT MINING JOURNAL,80, P 180.

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:162 Base Elevation: +146 Thickness: 162
Geologic Description: BASALT
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:208 Base Elevation: +100 Thickness: 46
Geologic Description: LABILE ARENITE AND LT GREY-GREY SLTST WITH SH,MDST, AND COAL; PLANT FOSSILS.
Reported Environment: CONTINENTAL. (FLUVIAL FLOOD PLAIN - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INFERRED COAL	179	+129	1
COAL	183	+125	<1
COALY SHALE	198	+110	1
COAL	208	+100	3

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:208 Base Elevation: +100 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:282 Base Elevation: +26 Thickness: 74
Geologic Description: SLTST AND SUB-LAB TO LAB AND QZ ARENITE WITH SH AND CARB SH AND MINOR COAL; WORM BURROWS AND PLANT FOSSILS
Reported Environment: PARALIC.(VARIETY OF NEAR SHORE ENVIRONMENTS WITH DECLINING MARINE INFLUENCE - KOPPE, 1974)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CARBONACEOUS SHALE	227	+81	2
INFERRED COAL	237	+71	2
CARBONACEOUS SHALE	241	+67	<1

Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:404 Base Elevation: -96 Thickness: 122
Geologic Description: FINE, LT GY, QZ ARENITE WITH SLTST AND RARE COAL AND CARB SH. ARENITE IS MICAC IN PARTS; WORM BURROWS; MARINE FOSSILS NEAR THE BASE

Reported Environment: MARINE OR PARALIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL AND CARB SHALE 339 -31 (1
Tectonic Structure: DIPS 2-6 DEGREES
Remarks

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y166
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness:)52
Geologic Description: GREY-DK GREY SLTST WITH MICAC QZ ARENITE; BRECCIA AT BASE; MARINE FOSSILS.
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 2-6 DEGREES
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness:)248
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EXMOOR, GERMAN CREEK AND MARIA FORMATIONS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness:)248
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP (EXMOOR, GERMAN CK, MARIA FMS)

CONTROL POINT: GROSVENOR NS 1-3,6

REFERENCE # 822

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21°31'08"S	147°59'30"E	+335	+336	-749	1085	C

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS - NORTH BOWEN BASIN BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2,ENC 1 Publn Year: 1979

Cross Reference: STAINES HRE AND KOPPE WH 1979 QLD GOVT MINING JOURNAL 80, 180
KOPPE WH 1974 QLD GOVT MINING JOURNAL 751 283

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:214 Base Elevation: +122 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:624 Base Elevation: -288 Thickness: 352
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1033 Base Elevation: -697 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:122 Base Elevation: +214 Thickness: 121
Geologic Description: BASALT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:214 Base Elevation: +122 Thickness: 92
Geologic Description: MUDSTONE, ARENITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:272 Base Elevation: +64 Thickness: 58
Geologic Description: SLTST, SH, LAB SST; MINOR MDST, CARB SH, LST, AND COAL. INTBDG, GLOSSOPTERIS PLANT FOSSILS, BIOTURBATION AT BASE.
Reported Environment: CONTINENTAL. (FLUVIAL - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	227	+109	1.4
COAL	236	+106	2

Tectonic Structure: DIPS 4-16 DG
Remarks: A FEW THINNER COAL SEAMS ALSO PRESENT (SEE GROSVENOR NS 6)

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:624 Base Elevation: -288 Thickness: 352
Geologic Description: LITHIC ARENITE, TFAC SLTST AND MDST, AND SLTST WITH COAL, CARB SH, MINOR CGL; PLANT FOSSILS
Reported Environment: FLUVIAL; MARGINAL VOLCANIC ACTIVITY (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF AND COAL	281	+55	9
TUFF AND COAL	228	+8	18
TUFF AND COAL	369	-33	12
TUFF AND COAL	422	-86	15

Tectonic Structure: DIPS 2-12 DG
Remarks: TUFF AND COAL ALSO REPORTED TO 503 M (-167 MSL; 30 M) AND 601 M (-265 M SL; 33 M). OTHER THINNER COALS ALSO PRESENT

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:837 Base Elevation: -501 Thickness: 213
Geologic Description: LABILE SST (QZ SST NEAR BASE) AND SLTST, WITH COAL AND MINOR TUFF. SOME XBDG, PLANT FOSSILS.
Reported Environment: FLUVIAL; MARGINAL VOLCANIC ACTIVITY (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	727	-391	3
COAL	832	-496	6
COAL	903	-567	6

Tectonic Structure: DIPS 10-15 DG
Remarks: OTHER THINNER COAL SEAMS PRESENT. FOR THESE, AND ANALYSES SEE GROSVENOR NS 2

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:837 Base Elevation: -501 Thickness: 623
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS RANGAL, FORT COOPER AND MORANBAH CM.

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:911 Base Elevation: -575 Thickness: 74
Geologic Description: SLTST AND SUB-LAB TO LAB QZ ARENITE WITH SH AND CARB SH, MINOR COAL. WORM BURROWS, PLANT FOSSILS
Reported Environment: PARALIC. VARIETY OF NEARSHORE ENVIRONMENTS WITH DECLINING MARINE INFLUENCE (KOPPE, 1974)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL AND CARB SHALE	904	-568	4
COAL AND CARB SHALE	912	-576	2

Tectonic Structure:
Remarks:

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1033 Base Elevation: -697 Thickness: 122
Geologic Description: F LT GREY QZ ARENITE WITH SLTST; RARE COAL AND CARB SH. ARENITE MICAC IN PARTS. WORM BURROWS, MARINE FOSSILS NEAR BASE
Reported Environment: MARINE-PARALIC
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 2-6 DG
Remarks

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:TD Base Elevation: -749 ± Thickness: >52
Geologic Description: GY-DK GY SILTSTONE WITH MICAC QZ SST; BRECCIA AT BASE. MARINE FOSSILS.
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 2-6 DG
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -749 ± Thickness: >248
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EXMOOR, GERMAN CREEK, AND MARIA FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -749 ± Thickness: >248
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EXMOOR, GERMAN CREEK, AND MARIA FMS OF BLENHEIM SUB-GROUP

CONTROL POINT: GROSVENOR NS 12

REFERENCE # B28

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 49'50"S	148 05'26"E	260	260	-262	522	

REFERENCE: KOPPE, W.H., AND SCOTT, S.C.
RECONNAISSANCE DRILLING IN THE NORTHERN BOWEN BASIN - RED HILL, BROADMEADOW AND WINCHESTER
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/31 Page FIG. 9 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:451 Base Elevation: -191 Thickness: 382
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -262 ± Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:44 Base Elevation: 216 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:69 Base Elevation: 191 Thickness: 25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 3-5 DG DIPS
Remarks NO THICKNESS CORRECTION

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:451 Base Elevation: -191 Thickness: 382
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIP 5-7 DG, 37 DG AND SLICKS AT 305 M
Remarks THICKNESS NOT CORRECTED FOR DIP AND SUSPECTED FAULT.

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -262± Thickness: >71

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 3 DG DIP
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y10S
Basal Information: Depth to Base:TD Base Elevation: -262# Thickness:)478
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 3-7 DG, 35 DG AND SLICKS AT 385 M
Remarks CONTAINS RANGAL, FORT COOPER AND MORANBAH CM.

CONTROL POINT: GROSVENOR NS 14

REFERENCE # B29

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-7	21 50'27"S	148 30'50"E	280	281	-230	511	

REFERENCE: Y1 HOLMES, P.R.
DEEP COAL RESOURCE DRILLING GOONYELLA EAST AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/47 Page FIG 4 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:154 Base Elevation: +127 Thickness:)153
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -230 # Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:154 Base Elevation: 127 Thickness: 153
Geologic Description: ARENITE, CGL, CLST, SLTST IN TOP; MDST, SLTST, COAL IN BOTTOM. PEBBLY, CARB, IRON CARBONATE, TONSTEIN(140M). COLOUR VARIES: GY-GN BN. PLANT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, DULL	94	187	1.5
TUFF	96	185	1.5
TUFF	130	143	1.5
COAL	146.30	134.70	3.63

Tectonic Structure: FRACTURES, SLICKS
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -230# Thickness:)357
Geologic Description: ARENITE, SLTST, MDST, SH, COAL; MNR LST, TONSTEIN, TUFF. INTBDD-LAMD, XBDD, BIOTURB. CARB, ARGIL, FE CO3, FERRUNG. FOSS WOOD, RIPPLES.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LST	198	83	(1
TUFF	257	24	1.5
COAL, GOONYELLA M.SM	289.26	-8.26	7.35
COAL, GOONYELLA L.SM	364.79	-83.79	7.01

Tectonic Structure: 2-8 DG DIP, SLICKS, CONE-IN-CONE
Remarks OTHER FEATURES: LST(234M), TONSTEIN(283,288M), COAL(GOONYELLA U.SM 189M, OTHER SMALL SMS T'OUT)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -230# Thickness:)510
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTAINS FORT COOPER AND MORANBAH CM

CONTROL POINT: GROSVENOR NS 2

REFERENCE # B22 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 38'56"S	147 56'42"E	+311	+312	-143	455	*

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS -NORTH BOWEN BASIN BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2,EN1,F5,6 Publn Year: 1979

Cross Reference: KOPPE, W.H. 1974 QLD GOVT MINING JOURNAL, 75, 283 / STAINES, H.R.E. AND KOPPE, W
.H. 1979, QLD GOVT MINING JOURNAL,80, P 190.

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:148 Base Elevation: +164 Thickness: 147
Geologic Description: BASALT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code Y102
Basal Information: Depth to Base:214 Base Elevation: +98 Thickness: 66
Geologic Description: SLTST, MDST, CARB SHALE, AND LABILE ARENITE; PLANT FOSSILS
Reported Environment: CONTINENTAL. (FLUVIAL AND MARGINAL VOLCANIC ACTIVITY - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY INTERVAL	160	+152	3
COALY INTERVAL	165	+147	3
COALY INTERVAL	177	+135	3
COAL	213	+99	3

Tectonic Structure:
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:427 Base Elevation: -115 Thickness: 213
Geologic Description: LABILE ARENITE (QZ NEAR BASE) AND SLTST WITH COAL AND MINOR TUFF, SOME XBDG; PLANT FOSSILS
Reported Environment: CONTINENTAL. (FLUVIAL FLOOD PLAIN - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, GOONYELLA UPP.	250	+62	3
COAL AND TUFF	322	-10	3
COAL, GOONYELLA MID.	355	-43	6
COAL, GOONYELLA LOW.	426	-114	6

Tectonic Structure: DIPS 10-15 DEG
Remarks: COAL 274 M (+38 MSL, 1 M THICK); COAL 306 M (+6 MSL, 2 M THICK); COAL 381 M (-69 MSL, 3 M THICK); COAL 417 M (-105, 2 M)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:427 Base Elevation: -115 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS FORT COOPER AND MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -143 * Thickness: >28

Geologic Description: SLTST, MDST, QZ SST, CARB SH; PLANT FOSSILS AT TOP
Reported Environment: PARALIC. (VARIETY OF NEAR SHORE ENVIRONMENTS WITH DECLINING MARINE INFLUENCE - KOPPE, 1974)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	CARBONACEOUS SHALE	450	-138	5

Tectonic Structure: DIP 6 DEGREES.
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -143 ± Thickness: >28
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS EXMOOR FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -143 ± Thickness: >28
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS BLENHEIM FM SUB-GROUP (EXMOOR FM)

CONTROL POINT: GROSVENOR NS 23

REFERENCE # 837

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-11	22 06'47"S	148 05'20"E	+233	+234	-121	355	

REFERENCE: WILLIN, C.I., AND KOPPE, W.H.
AN EVALUATION OF COAL RESOURCES IN THE MORANBAH AREA, CENTRAL QUEENSLAND
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/49 Page 8-9; D-9 Publn Year: 1978

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:98 Base Elevation: +136 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -121 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:75 Base Elevation: +159 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:98 Base Elevation: +136 Thickness: 23
Geologic Description: TUFFACEOUS AND CARBONACEOUS MUDSTONE, TUFF, AND COAL
Reported Environment: NON-MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL; FAIR HILL SEAM 98 +136 3
Tectonic Structure:
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -121 * Thickness: >257
Geologic Description: ARENITE, SLTST, MDST AND SH (CARB IN PARTS), MINOR CGL AND TUFF AND COAL; THINLY BDD, XBDD, CARB AND SH LENSES; PLANT FOSSILS, ORGANIC BURROWS
Reported Environment: FLUVIAL FLOOD PLAIN (DEPOSITED IN STREAM CHANNELS, SHALLOW LAKES,SWAMPS, AND AS CREVASSE SPLAY DEPOSITS)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL; R SEAM 106 +128 8
COAL; Q SEAM 141 +93 4
COAL; P SEAM 195 +39 5.7
COAL; HARROW CK SEAM 244 -10 5

Tectonic Structure: DIPS GEN 1-12 DG. ONE READING OF 35 DG
Remarks HARROW CK LOWER SEAM AT 272 M (-38 MSL, 3.5 M THICK); OTHER, SMALLER SEAMS ALSO PRESENT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code: Y184
Basal Information: Depth to Base: TD Base Elevation: -121 M Thickness: >280
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF FORT COOPER AND MORANBAH CM

CONTROL POINT: GROSVENOR NS 3

REFERENCE # B22 B

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 31'07"S	147 58'08"E	+323	+323	-133	456	*

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS - NORTH BOWEN BASIN BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page E,ENC 1,F4 Publn Year: 1979

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD GOVT MINING JOURNAL 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:84 Base Elevation: +239 Thickness: 84
Geologic Description: BASALT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:436 Base Elevation: -113 Thickness: 352
Geologic Description: LITHIC ARENITE TFAC SILTSTONE AND MUDSTONE, AND SILTSTONE WITH COAL, CARB SHALE, MINOR CONGLOMERATE; PLANT FOSSILS.
Reported Environment: CONTINENTAL. (FLUVIAL WITH MARGINAL VOLCANIC ACTIVITY - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF AND COAL	93	+238	9
TUFFS AND COAL SEAMS	181	+142	59
TUFF AND COAL	234	+89	15
TUFFS AND COAL SEAMS	321	+2	36

Tectonic Structure: DIPS 2-12 DEGREES
Remarks CONGLOMERATE 346 M (-23 MSL, 3 M THICK); TUFF AND COAL 413 M(-90 MSL, 33 M THICK); COAL AT 436 M (-113 MSL, 1 M THICK)

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -133 * Thickness: >20
Geologic Description: SILTSTONE, ARENITE, MUDSTONE. MUDSTONE IS PARTIALLY BRECCIATED
Reported Environment: CONTINENTAL. (FLUVIAL WITH MARGINAL VOLCANIC ACTIVITY - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -133 * Thickness: >372
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FORT COOPER AND MORANBAH CM

CONTROL POINT: GROSVENOR NS 44

REFERENCE # B32

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 58'46"S	148 02'44"E	+218	+218	-148	366	

REFERENCE: WALLIN, C.I., AND KOPPE, W.H.
AN EVALUATION OF COAL RESOURCES IN THE MORANBAH AREA, CENTRAL QUEENSLAND
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/49 Page 8-9,F D-26 Publn Year: 1978

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD GOVT MINING JOURNAL 80, 188

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:32 Base Elevation: +186 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:364 Base Elevation: -146 Thickness: 332
Geologic Description: F-M GRAINED LABILE ARENITE WITH SLTST AND MDST AND COAL; CARBONACEOUS LENSES; PLANT FOSSILS.
Reported Environment: FLUVIAL FLOOD PLAIN: STREAM CHANNELS, SHALLOW LAKES, SWAMPS AND CREVASSE SPLAYS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, P SEAM	141	+77	6
COAL, HARROW CK SM	196	+22	6
COAL, UPPER DYSART	271	-53	4
COAL, LOWER DYSART	311	-93	4

Tectonic Structure: DIPS 2-3 DEGREES
Remarks 'P' TUFF AT 155 M(+63 MSL, (1 M THICK); DYSART RIDER SMS 294 M(-76 MSL,1 AND 1.5 M THICK); COAL 338 M(-120 MSL, 1 M)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:364 Base Elevation: -146 Thickness: 332
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MORANBAH CM

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness: 32
Geologic Description: QZ ARENITE
Reported Environment: PARALIC (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y1C5
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness: >2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GERMAN CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y1C6
Basal Information: Depth to Base:TD Base Elevation: -148 ± Thickness: >2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GR (GERMAN CK FM)

CONTROL POINT: GROSVENOR NS 49R

REFERENCE # B31

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 56'08"S	148 00'02"E	+234	+235	-165	400	

REFERENCE: WALLIN, C.I., AND KOPPE, W.H.
AN EVALUATION OF COAL RESOURCES IN THE MORANBAH AREA, CENTRAL QUEENSLAND
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/49 Page B-9,F B-30 Publn Year: 1978
Cross Reference: STAINES HRE AND KOPPE WH 1979 QLD GOVT MINING JNOURNAL 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:172 Base Elevation: +63 Thickness: >127
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +63 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:45 Base Elevation: +190 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:172 Base Elevation: +63 Thickness: 127
Geologic Description: MDST, CARB MDST, TUFF, COAL, LABILE ARENITE, AND SLTST
Reported Environment: FLUVIAL; MARGINAL VOLCANIC ACTIVITY (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF AND COAL	111	+124	2
COAL, 2 SMS (((M)	140	+95	4
COAL	160	+75	4
COAL	165	+70	3

Tectonic Structure:
Remarks OTHER THIN COAL ALSO PRESENT BETWEEN 168-172 M DEPTH (+67 TO +67 MLS)

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -165 ± Thickness: >228
Geologic Description: LABILE ARENITE, GREY MDST, AND SLTST, WITH COAL AND TUFF; SOME SLUMP STRUCTURES; PLANT FOSSILS
Reported Environment: FLUVIAL FLOOD PLAIN: STREAM CHANNELS, SHALLOW LAKES, SWAMPS, AND CREVASSE SPLAY DEPOSITS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, "Q" LOWER GM	205	+38	3

	COAL, "P" SEAM	250	-15	6
	COAL, HARROW CK SM	297	-62	9
	COAL, L. DYSART SM	366	-131	3

Tectonic Structure: DIPS 2-5 DG
Remarks: OTHER THINNER ((2 M) COAL AT: 257 M (-22 MSL), 328 M (-93 MSL), 338 M (-103 MSL), 379 M (-144 MSL), 391 M (-156 MSL).

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -165 # Thickness:)355
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS FORT COOPER AND MORANBAH CM.

CONTROL POINT: GROSVENOR NS 6

REFERENCE # B22 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 31'08"S	147 59'30"E	+335	+336	-116	452	&Z

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
STRATIGRAPHIC AND COAL RESOURCE DRILLING SUTTOR CREEK AND LENTON DOWNS - NORTH BOWEN BASIN BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/35 Page 2,ENC 1 Publn Year: 1979

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD GOVT MINING JOURNAL 80, 180

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y191
Basal Information: Depth to Base:122 Base Elevation: +214 Thickness: 121
Geologic Description: BASALT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:214 Base Elevation: +122 Thickness: 92
Geologic Description: MUDSTONE AND ARENITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:272 Base Elevation: +64 Thickness: 58
Geologic Description: SLTST, SHALE, LAB ARENITE, MINOR MUDSTONE, CARB SH, LST, COAL. INTBDG, BIOTURBATION AT BASE. GLOSSOPTERIS PLANT FOSSILS.
Reported Environment: CONTINENTAL. (FLUVIAL - STAINES + KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	215	+121	(1
COAL, LEICHHARDT SM	227	+109	1.4
COAL	238	+186	2
LIMESTONE	268	+68	(1

Tectonic Structure: DIPS 4-16 DEGREES
Remarks: COAL ALSO AT 272 M (+64 MSL, (1 M THICK)

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -116 ? Thickness:)180
Geologic Description: LABILE-TFAC ARENTIE, MDST, AND SLTST (GENERALLY TFAC), TUFF, SH, AND COAL; CARB FRAGMENTS; PLANT FOSSILS
Reported Environment: CONTINENTAL. (FLUVIAL WITH MARGINAL VOLCANIC ACTIVITY - STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF AND COAL	301	+35	29
TUFF	322	+14	6
TUFF	328	+8	4
TUFF AND COAL	358	-22	26

Tectonic Structure:
Remarks: TUFF AND COAL HORIZONS ALSO AT: 391 M (-55 MSL, 15 M THICK) AND 442 M (-106 MSL, 12 M THICK)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -116 ? Thickness:)238
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL AND FORT COOPER CM.

CONTROL POINT: GROSVENOR NS 62

REFERENCE # B27

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 42'55"S	148 03'02"E	275	276	91	185	

REFERENCE: KOPPE, W.H., AND SCOTT, S.G.
RECONNAISSANCE DRILLING IN THE NORTHERN BOWEN BASIN - RED HILL, BROADMEADOW AND WINCHESTER
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/31 Page FIG. 7 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +91 # Thickness:)90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +91 Thickness:)115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:32 Base Elevation: 244 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:70 Base Elevation: 206 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:95 Base Elevation: 181 Thickness: 25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: 91# Thickness:)90

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: 91# Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL AND FORT COOPER CM.

CONTROL POINT: GROSVENOR NS 73

REFERENCE # B24

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE	SF/55-7	21 38'17"S	147 59'08"E	312	312	-153	465	

REFERENCE: Y1 HOLMES, P.R.
DEEP COAL RESOURCE DRILLING GOONYELLA EAST AREA BASIC DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/47 Page FIG 6 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:171 Base Elevation: +141 Thickness: >171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -153 # Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:171 Base Elevation: 141 Thickness: 171
Geologic Description: VESICULAR BASALT AND CLST AT TOP, OPEN HOLE 32-146M, CARB MDST AND COAL TO BOTTOM. IRREG INTBNDD, ?BRONZE MICAS, ASH FALL, TFAC
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASALT AND CLST	30+	282	30+
ASH FALL-BRONZE MICA	158	154	
COAL	165	147	<1
COAL	170	142	1

Tectonic Structure:
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -153# Thickness: >465
Geologic Description: MDST, VF-C SST, SLTST, SH, COAL. IRREG INTBDD-LAMD, M & XBDD, BIOTURB. CARB, V MICAC, TFAC. CARB FRAG, SOME RIPPLES, WORM BURROWS, MUDCRACKS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, GOONYELLA U.SM	233.95	78.05	3.14
COAL, GOONYELLA M.SM	349.77	-37.77	7.11
COAL, GOONYELLA L.SM	393	-81	1
COAL, OTHER SMS	T'OUT		

Tectonic Structure: M'FAULTS, SLICKS, COAL DYKE, 1-5 DG DIP
Remarks COAL DYKE AT 212M, FRACTURES T'OUT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -153# Thickness: >465
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features:
Tectonic Structure:
Remarks

Feature	Depth	Elevation	Thickness
FORT COOPER AND MORANBAH CM			

CONTROL POINT: HARROW CREEK

REFERENCE # B42

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-11	22 17'55"S	148 05'31"E	+395	+395	+270	125	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page PL 12 Publn Year: 1964

Cross Reference: OLGERS F 1969 CLERMONT 1:250,000 EXPLAN NOTES SF/55-11, MAP

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +270 ± Thickness: >125
Geologic Description: INTBDD M-C QZ (SOME FELD) SST AND SLTST; SST GENERALLY VERY THICK BDD; SLTST OCCASIONALLY MICACEOUS
Reported Environment: PARALIC, MARINE-FRESHWATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: LOW DIP
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +270 ± Thickness: >125
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP (UNDIFF)

CONTROL POINT: HAZELWOOD CREEK DC1

REFERENCE # Bi7

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-7	21 11'55"S	148 18'31"E	+330	+330	+54	276	

REFERENCE: MALONE, E.J., CORBETT, D.W.P., AND JENSEN, A.R.
GEOLOGY OF THE MOUNT COOLON 1:250,000 SHEET AREA
BUREAU OF MINERAL RESOURCES REPORT NO. 64 Page 24, PL 1,3 Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +54 * Thickness:)237
Geologic Description: THIN BDD TO AMD, OCCASIONALLY INTBDD, F-C QZ GWKE AND HARD CALC QZ GWKE; CALC BDS AND LENSES; PECTINIDS AND SPERIFIDS.
Reported Environment: MARINE, MODERATELY DEEP WATER.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PECTNIDS	5	+324	
SPERIFIDS	190	+140	

Tectonic Structure: DIPS 25-37 DG SW
Remarks

CONTROL POINT: HILLALONG NS 1

REFERENCE # B10 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-3	20 56'48"S	148 03'12"E	+248	+248	-217	457	RZ

REFERENCE: KOPPE, W.H.
DEPARTMENTAL DRILLING, EXMOOR AND HAIL CREEK EAST, NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/6 Page 9,18;F17 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:269 Base Elevation: -29 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:297 Base Elevation: -57 Thickness: 28
Geologic Description: LABILE SST WITH VOLC PEBBLES AND LARGE CARBONACEOUS FRAGMENTS, COKED COAL, INTRUSIVES AND MINOR MUDSTONE
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COKED COAL/INTRUSIVE	273	-33	8

Tectonic Structure: DIPS 7 DG
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -217 * Thickness: >160
Geologic Description: LAB SST, INTBDD CARB SH AND TFAC MDST, AND CGL WITH SH, MDST, SLIST, COAL (SOME CKD) AND INTRUSIVES; CARB FRAGS, FOSSIL WOOD; TUFFACEOUS T'OUT
Reported Environment: LOCALISED PIEDMONT CONDITIONS; VOLCANIC PROVENANCE; CONTEMPORANEOUS VOLCANIC ACTIVITY
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
SH/CKD COAL/INTRUS	306	-66	9
CARB SH/TFAC MDST	365	-125	8
INF COAL/CARB SH	395	-155	<1

Tectonic Structure: DIPS 3-9 DG
Remarks: CALLED FORT COOPER CM 'A' IN REFERENCE REPORT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -217 * Thickness: >188
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF RANGAL CM AND FC (COOPER CM 'A'

CONTROL POINT: HILLALONG NS 1-4

REFERENCE # B18

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-3	20 56'48"S	148 03'12"E	+248	+248	-1302	1542	C

REFERENCE: KOPPE, W.H.
DEPARTMENTAL DRILLING, EXMOOR AND HAIL CREEK EAST, NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/6 Page 8-10;F3,11 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:270 Base Elevation: -30 Thickness: >270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:859 Base Elevation: -619 Thickness: 562
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1480 Base Elevation: -1240 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:269 Base Elevation: -29 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:297 Base Elevation: -58 Thickness: 28
Geologic Description: LABILE SST WITH VOLC PEBBLES AND LARGE CARB FRAGMENTS, COKED COAL, INTRUSIVES, MINOR MDST. MEDIUM SCALE CROSS-STRATIFICATION IN OUTCROP
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CKD COAL & INTRUSIVE	273	-33	8

Tectonic Structure: DIPS 7 DG
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:859 Base Elevation: -619 Thickness: 562
Geologic Description: LAB SST, MDST, TFAC MDST, SLTST, CARB SH, COAL, MINOR CGL, INTRUS AND TUFF; CARB FRAG; PLANT FOSS; TFAC T'OUT.
Reported Environment: LOCALIZED PIEDMONT CONDITIONS; VOLCANIC PROVENANCE; CONTEMPORARY VOLC ACTIVITY. FLUVIAL CHANNELS AND OVERBANK ENVIRONMENT ASSOCIATED WITH SWAMPS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL,CKD + INTRUSIVE	306	-66	9
COAL,CKD + INTRUSIVE	556	-316	10
COAL,CKD + INTRUSIVE	621	-381	7
COAL, AND INTRUSIVE	663	-433	19

Tectonic Structure: DIPS 3-9 DG
Remarks: DIVIDED INTO FORT COOPER CM 'A' (UPPER 160 M) AND FORT COOPER CM 'B' (LOWER 402 M) IN REFERENCE REPORT

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1382 Base Elevation: -1142 Thickness: 498
Geologic Description: LAB CALC AND TFAC SST, MDST, SLTST, SH, CARB SH, CGL, COAL, AND INTRUSIVES; PLANT FOSS AND CARB FRAG. FOSS LOGS ASSOCIATED WITH CGL.
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL,CKD + INTRUSIVE	950	-718	18
COAL	1899	-859	7
INTRUSIVES, CKD COAL	+198	-958	30
COAL,CKD + INTRUSIVE	1383	-1163	7.5

Tectonic Structure:
Remarks: THICKNESS CORRECTED FOR 18 DG DIP. FOR MORE DETAIL ON GEOL FEATURES REFER TO HILLALONG NS 3 AND 4.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1382 Base Elevation: -1142 Thickness: 1888
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS RANGAL CM, FORT COOPER CM, MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1480 Base Elevation: -1240 Thickness: 94t
Geologic Description: SUB-LAB TO LAB QZ SST, SLTST, MDST, CARB SH, COAL, INTRUSIVES; PLANT FOSS, WORM BURROWS, CARB FRAG, SHELLS AT BASE. FINE LAMINAE. SOME SLUMPING
Reported Environment: MARINE AT BASE; GRADUAL WITHDRAWL OF THE SEA
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE + CKD COAL	1397	-1157	2

Tectonic Structure: DIPS 18-21 DG
Remarks: THICKNESS CORRECTED FOR 15.5 DG DI.

STRATIGRAPHY: UNDIFF BLENHEIM S-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -1302# Thickness:)62
Geologic Description: QZ SST WITH SLTST, AREN MDST, AND INTRUSIVES; ORG BURROWS; MARINE FOSS AT BASE, PLANT FOSS AT TOP
Reported Environment: SHELTERED, QUIESCENT MARINE ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 8-13 DG.
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1302# Thickness:)155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS EXMOOR FM AND UDIFF BLENHEIM.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:TD Base Elevation: -1302' Thickness: >155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP: EXMOOR FM AND UNDIFF BLENHEIM

CONTROL POINT: HILLALONG NS 2

REFERENCE # B10 B

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-3	20 56'40"S	148 04'14"E	+228	+228	-260	488	*

REFERENCE: KOPPE, W.H.
DEPARTMENTAL DRILLING, EXMOOR AND HAIL CREEK EAST, NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/6 Page 8,9;F15 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM 'A' Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:78 Base Elevation: +142 Thickness: 76†
Geologic Description: LABILE SST, VOLC-DERIVED CGL, MUDSTONE (SOME TFAC), SHALE, CARB SHALE AND MINOR SLTST; FOSSIL WOOD IN CGL; PLANT FOSSILS
Reported Environment: LOCALISED PIEDMONT CONDITIONS; VOLCANIC PROVENANCE; CONTEMP VOLCANIC ACTIVITY
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 13 DG
Remarks THICKNESS CORRECTED. 'A' AND 'B' ARE INFORMAL MEMBERS OF FORT COOPER CM

STRATIGRAPHY: FORT COOPER CM 'B' Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -260 * Thickness:)402
Geologic Description: LABILE SST, MDST, TFAC MDST, SLTST, INTRUSIVES, TUFF, CARB SH, COAL, CKD COAL AND MINOR CGL; CARB FRAGMENTS, PLANT FOSSILS; TFAC T'OUT
Reported Environment: FLUVIAL CHANNELS AND OVERBANK ENVIRONMENTS ASSOCIATED WITH SWAMPS: VOLCANIC PROVENANCE; CONTEMP VOLCANIC ACTIVITY
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL/INTRUS/CKD COAL	177	+43	10
COAL/INTRUS/CKD COAL	262	-42	7
COAL/INTRUS/SH/MDST	294	-74	19
INTRUSIVE/CKD COAL	472	-252	11

Tectonic Structure: DIPS 3-15 DG
Remarks

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -260 * Thickness:)478
Geologic Description: SEE FORT COOPER CM 'A' AND 'B'
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FORT COOPER CM 'A' AND 'B'

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -260 * Thickness:)478
Geologic Description: ?
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF FORT COOPER CM ('A'+'B')

CONTROL POINT: HILLALONG NS 3

REFERENCE # B18 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-3	20 56'19"S	148 05'01"E	+218	+218	-266	476	*

REFERENCE: KOPPE, W.H.
DEPARTMENTAL DRILLING, EXMOOR AND HAIL CREEK EAST, NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/6 Page 8,9;F13 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: FORT COOPER CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:46 Base Elevation: +164 Thickness: 45t
Geologic Description: MUDSTONE, SILTSTONE, CARB SH, TFAC SST, TUFF, COAL, CKD COAL, INTRUSIVES; CARBONACEOUS AND CLAY FRAGMENTS; COAL DULL AND INFERIOR
Reported Environment: FLUVIAL CHANNELS AND OVERBANK ENVIRONMENTS ASSOCIATED WITH SWAMPS; VOLCANIC PROVENANCE; CONTEMP VOLCANIC ACTIVITY
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL/CKD COAL/INTRUS	46	+164	15

Tectonic Structure: DIPS 6 AND 18 DG
Remarks CALLED FORT COOPER CM 'B' IN REFERENCE REPORT. THICKNESS CORRECTED.

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -266 * Thickness:)415t
Geologic Description: CALC AND LAB SST, MDST, SLTST, SH, CARB SH, INTRUSIVES, COAL, CKD COAL, CGL; FOSSILS LOGS ASSOC WITH CGL; PLANT FOSSILS AND CARB FRAGMENTS
Reported Environment: BASICALLY FLUVIAL ENVIRONMENT
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CKD COAL/INTRUS/SH	137	+73	10
COAL	286	-76	7
INTRUSIVE/CKD COAL	361	-151	8.5
CKD COAL/INTRUSIVE	385	-175	4.6

Tectonic Structure: DIPS VARY FROM 6 TO 32 DG
Remarks THICKNESS CORRECTED USING AVERAGE DIP OF 15 DG. CONTAINS MORE, SMALLER SEAMS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -266 * Thickness:)460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONSISTS OF FORT COOPER CM 'B' AND MORANBAH CM

CONTROL POINT: HILLALONG NS 4

REFERENCE # B:0 D

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-3	20 55'49"S	148 05'18"E	+208	+208	-280	488	1

REFERENCE: KOPPE, W.H.
DEPARTMENTAL DRILLING, EXMOOR AND HAIL CREEK EAST, NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/6 Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:240 Base Elevation: -40 Thickness: 224t
Geologic Description: LAB SST, MUDSTONE, SILTSTONE, CARB SH, TFAC SST, COAL, CKD COAL, INTRUSIVES AND CONGLOMERATE; FOSSIL LOGS, CARBONACEOUS FRAGMENTS
Reported Environment: BASICALLY FLUVIAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL/CKD COAL/INTRUS	56	+144	9
COAL/CKD COAL/INTRUS	161	+39	7.5
CKD COAL/INTRUSIVE	226	-26	10
CKD COAL/INTRUSIVE	237	-37	3

Tectonic Structure: DIPS VARY FROM 13 TO 48 DG
Remarks THICKNESS CORRECTED USING AN AVERAGE DIP OF 21 DG

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:240 Base Elevation: -40 Thickness: 224
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:338 Base Elevation: -138 Thickness: 94
Geologic Description: SUBLAB-QZOSE SST, SLIST, MDST, INTRUSIVES, CKD COAL AND CARB SH; PLANT FOSSILS, WORM BURROWS, CARB FRAGS, SHELLS AT BASE; F LAMN; SOME SLUMPING
Reported Environment: MARINE AT BASE, GRADUAL WITHDRAWAL OF THE SEA
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSIVE/CKD COAL	255	-55	2

Tectonic Structure:
Remarks DIPS VARY FROM 8 TO 21 DG THICKNESS CORRECTED USING AVERAGE DIP OF 15.5 DG

STRATIGRAPHY: UNDIFF BLENHEIM S-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -280 ± Thickness: >62
Geologic Description: QZOSE SST WITH SILTSTONE, ARENACEOUS MDST AND INTRUSIVES; ORGANIC BURROWS; MARINE FOSSILS AT BASE, PLANT FOSSILS AT TOP
Reported Environment: SHELTERED QUIESCENT MARINE ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS VARY FROM 8 TO 13 DG
Remarks CALLED BLENHEIM FORMATION BY KOPPE

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -280 ± Thickness: >156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONSISTS OF EXMOOR FM AND UNDIFF. BLENHEIM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -280 ± Thickness: >156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF EXMOOR FM AND UNDIFF. BLENHEIM OF BLENHEIM SUB-GROUP

CONTROL POINT: LIZZIE CREEK DC3

REFERENCE # B16

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-7	21 11'05"S	148 18'11"E	+300	+300	-50	350	

REFERENCE: MALONE, E.J., CORBETT, D.W.P., AND JENSEN, A.R.
GEOLOGY OF THE MOUNT COOLON 1:250,000 SHEET AREA
BUREAU OF MINERAL RESOURCES REPORT NO. 64 Page 19, PL 1,2 Publn Year: 1964

Cross Reference: DICKINS JM AND MALONE EJ 1973, BMR BULLETIN 130, 34-36

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: LIZZIE CREEK VOLC Age: PERMIAN Interpretation Code:Y181
Basal Information: Depth to Base:TD Base Elevation: -50 # Thickness:)252
Geologic Description: ANDESITE FLOWS, TUFFS, SLTST, MDST, CALC GWKE, AND AGGLOMERATE; SLTST AND TUFFS ARE INTBDD.ES; PECTINIDS AND SPERIFIDS.
Reported Environment: NEAR SHORE; TROUGH TO WEST OF CONNORS ARCH (DICKINS AND MALONE, 1973). CONSIDERABLE DISTANCE FROM SOURCE, POSSIBLY DEEP MARINE; SOME VOLCANISM.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS VARY FROM 32-63 DG.
Remarks

CONTROL POINT: MOUNT FLORA

REFERENCE # 833

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-8	21 54'00"S	148 34'15"E	+180	+180	-4476	4656	

REFERENCE: JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE MACKAY 1:250,000 SHEET AREA QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 164 Page 24-25,PL1 Publn Year: 1966

Cross Reference: DICKINS AND MALONE 1973, BMR BULLETIN 130, 122

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X.
Basal Information: Depth to Base:860 Base Elevation: -680 Thickness: 430
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:860 Base Elevation: -680 Thickness: 430
Geologic Description: XBDD LITHIC SST INTBDD WITH THIN BDS OF BROWN (SIDERITE?) CARBONATE ROCK OR CONGLOMERITIC LITHIC SST WITH WHITE MICAC QZ SLTST; FOSSIL WOOD
Reported Environment: CONTINENTAL ENVIRONMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 60 DG NNE
Remarks THICKNESS APPROXIMATE. BASE ELEVATION DETERMINED BY CALCULATING APPARENT THICKNESS FOR 60 DG DIP.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -4476* Thickness:)2440
Geologic Description: INTBDD BLUE AND WHITE SLTST, PURPLE SLTST, QZ SST, AND PBL CGL. ANDALUSITE HORNFELS NEAR INTRUSION. SST THICK BDD AND XBDD. CONTAINS CRINOIDS
Reported Environment: SHALLOW TO MODERATELY DEEP SEA (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 30-60 DG NNE
Remarks BASE ELEVATION DETERMINED BY CALCULATING APPARENT THICKNESS FOR 60 DG AVERAGE DIP

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -4476* Thickness:)2440
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GR (UNDIFF)

CONTROL POINT: MOUNT LANDSBOROUGH

REFERENCE # B26

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-8	21 35'00"S	149 32'48"E	+245	+245	-3453	3698	

REFERENCE: JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE MACKAY 1:250,000 SHEET AREA QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 104 Page 12-25,PL1 Publn Year: 1966
Cross Reference: DICKINS AND MALONE 1973, BMR BULLETIN 130

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:54 Base Elevation: +191 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:54 Base Elevation: +191 Thickness: 38
Geologic Description: SILSTONE, LITHIC SANDSTONE, AND CONGLOMERATE; PLANT DEBRIS
Reported Environment: CONTINENTAL ENVIRONMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 40-50 DG
Remarks ALL BASE ELEVATIONS DETERMINED BY CALCULATING APPARENT THICKNESS FOR AVG DIP OF 45 DG.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:2260 Base Elevation: -2015 Thickness: 1560
Geologic Description: LT TO DK BLUISH-GREY MICACEOUS SILTSTONE WITH SCATTERED PEBBLES
Reported Environment: MARINE (SHALLOW TO MODERATELY DEEP SEA - DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
BIG STROPHALOSIA? ZN 595 -350
Tectonic Structure: DIPS 30-50 DG
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:2872 Base Elevation: -2627 Thickness: 433
Geologic Description: MEDIUM QZ SST WITH INTBDD SLTST AND THIN-BDD FINE SILTY QZ SST; MARINE FOSSILS
Reported Environment: MARINE (PARALIC- DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 20-75 DG WSW
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:3659 Base Elevation: -3414 Thickness: 556
Geologic Description: BROWN FERRUGINOUS CALC MDST GRADING TO FERRUGINOUS LITHIC SST, COQUINITEIN PLACES; MARINE FOSSILS
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y105

Basal Information: Depth to Base:3659 Base Elevation: -3414 Thickness: 2549
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS.

STRATIGRAPHY: LIZZIE CREEK VOLC Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -3453# Thickness:)28
Geologic Description: BASIC-FELSIC LAVAS (MOSTLY ANDESITE AND RHYOLITE), AGGLOMERATE, AND SOME SEDIMENTS (SH, LITHIC SST, CGL)
Reported Environment: NEAR SHORE (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 40-50 DG WSW.
Remarks

CONTROL POINT: O.K. BORE

REFERENCE # 836

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	BORE	SF/55-11	22 11'05"S	147 50'16"E	+300 ?	+300 ?	+220	80	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page 22 Publn Year: 1964

Cross Reference: STAINES, H.R.E. AND KOPPE, W.H. 1979, QLD. GOVT MINING JOURNAL, 80, 179

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: 200 Thickness: >50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 270 M(AT SURFACE). VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:30 Base Elevation: +270 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +200 # Thickness: >50
Geologic Description: COALY SHALE AND RED SANDSTONE; WHITE ROTTEN SANDSTONE AT BASE
Reported Environment: NON-MARINE FACIES OF A DELTA SYSTEM (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY SHALE	31	+269	1
COALY SHALE	65	+235	20
COALY SHALE	69	+231	1.5

Tectonic Structure:
Remarks STRATIGRAPHY NOT CERTAIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +200 # Thickness: >50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +200 # Thickness: >50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM OF GEBBIE SUB-GROUP

CONTROL POINT: PARROT CREEK

REFERENCE # BB

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-3	20 57'17"S	147 44'34"E		+230	-612	842	

REFERENCE: MALONE, E.J., JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE SOUTHERN HALF OF THE BOWEN 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 100 Page 31-39;PL 5 Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:841 Base Elevation: -611 Thickness: 427
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 164 M. VALUES USED IN CONTOUR MAPPING

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:414 Base Elevation: -184 Thickness: 414
Geologic Description: LAMINATED MICACEOUS QZ SST AND QZ GREYWACKE (CALCAREOUS AND GRADING TO COQUINITE IN PLACES); MARINE FOSSILS
Reported Environment: MARINE (NOT SHALLOW)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
BIG STROPHALOSIA ZN 337 -107
Tectonic Structure: DIPS 5 DG SOUTH-EAST AND EAST
Remarks SECTION PROJECTED UNDERNEATH YOUNGEST ROCKS I.E. TOP OF BLENHEIM SUB-GP

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:841 Base Elevation: -611 Thickness: 427
Geologic Description: BASAL VOLCANIC-DERIVED CONGLOMERATE/BRECCIA WITH THIN SLTST INTBDS; QZ GREYWACKE AND SLTST (GLENDOO SST MB); MARINE FOSSILS
Reported Environment: DELTAIC OR PALUDAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
GLENDOO SST MEMBER 679 -449
Tectonic Structure: DIPS 2-8 DG SE-ENE
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:841 Base Elevation: -611 Thickness: 427
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:841 Base Elevation: -611 Thickness: 841
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM SUB-GP AND COLLINSVILLE CM OF GEBBIE SUB-GP

STRATIGRAPHY: BULGONUNNA VOLC Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -612$ Thickness:)1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: QUARRY HILL SHAFT

REFERENCE # 857

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	MINE SHAFT	SF/55-11	22 49'48"S	147 39'03"E	+270 ?	+270 ?	+115	155	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page 39; PL 13 Publn Year: 1964

Cross Reference: COOK, F.W. AND TAYLOR, C.P. 1979, QLD. GOVT MINING JOURNAL, 80, 347 // OLGERS,F. 1969, CLERMONT 1:250,000 EXPLANATORY NOTES SF/55-11, 6-7

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BACK CREEK CP Age: PERMIAN Interpretation Code:Yi01
Basal Information: Depth to Base:TD Base Elevation: +115 ? Thickness:)155
Geologic Description: INTBDD FINE ARENITE AND SHALE, INTBDD ARENITE AND SLTST, AND FERRUGINOUS SHALE; MINOR COAL AND CONGLOMERATE: MARINE FOSSILS IN BASAL SHALE
Reported Environment: MARINE; SHALLOW SHELF NEAR WESTERN MARGIN OF BOWEN BASIN (OLGERS, 1969);FRESHWATER UNIT UNDERLAIN BY MARINE FORMATION (COOK AND TAYLOR, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	67	+203	1
PLANT FOSSILS	116	+154	
CGL:GRAN,SCH,SLATE	120	+150	5
MARINE FOSSILS	143	+127	

Tectonic Structure:
Remarks FOSSILS BELONG TO CLARKE1 BED. OLGERS REFERS TO AT LEAST PART OF THE SECTION AS BEING BLENHEIM SUB-GROUP

CONTROL POINT: ROPER NS 3

REFERENCE # B62 Y1
REFERENCE # B62 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-12	22 57'36"S	148 42'44"E	146	147	-238	385	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
ANDERSON, J.C., AND JAMESON, P.R.
DEPARTMENTAL COAL EXPLORATION, NORTH CENTRAL BOWEN BASIN, ROPER CREEK EAST STAGE II
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1992/10
Page FIG B12 Publn Year: 1982
Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:35 Base Elevation: +112 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:176 Base Elevation: -29 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:367 Base Elevation: -220 Thickness: 191
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -238@ Thickness: >18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -238 Thickness: >289
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:35 Base Elevation: 112 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:176 Base Elevation: -29 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 3-5 DG
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:263 Base Elevation: -116 Thickness: 87
Geologic Description: F.M LITHIC SST WITH COAL, SLTST, MDST. CARB, COALY LAM, PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ROPER SM	177	-38	1
COAL, U MIDDLEMOUNT	190	-43	4
COAL, U TRALEE SM	232	-85	4
COAL, L TRALEE SM	263	-116	1

Tectonic Structure: 2 DG DIP AT BASE
Remarks: RANGAL-BURNGROVE BOUNDARY USED BY ANDERSON AND HAMESON IS HIGHER IN SEQUENCE THAN IN PREVIOUS GSQ RECORDS

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -238* Thickness: >122
Geologic Description: F-C SST AND CGL, MDST AND SLTS. INTBDD, CARB-COALY LAM, WOOD FRAGMENTS. COAL SMS AT BOTTOM
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF, YARRABEE TF MD	265	-118	<1
COAL, GIRRAH SM	374	-227	4
COAL	379	-232	1

Tectonic Structure:
Remarks: RANGAL-BURNGROVE BOUNDARY OF ANDERSON AND JAMESON IS HIGHER IN SEQUENCE THAN IN PREVIOUS GSQ RECORDS.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -238* Thickness: >289
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: RANGAL CM AND BURNGROVE FM.

CONTROL POINT: ROPER NS 6

REFERENCE # B61 Y1
REFERENCE # B61 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-12	22 53'52"S	148 39'42"E	154	154	-114	268	?

REFERENCE: X1
THIS REPORT
Page Publn Year.
Cross Reference:

REFERENCE: Y1
ANDERSON, J.C., AND JAMESON, P.R.
DEPARTMENTAL COAL EXPLORATION, NORTH CENTRAL BOWEN BASIN, ROPER CREEK EAST STAGE II
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1982/10 Page FIG B12 Publn Year: 1982
Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:124 Base Elevation: 30 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:>240 Base Elevation: -86# Thickness: >116?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 3-7 DG DIPS AT 230 M DEPTH
Remarks BASE OF HOLE AT 268 M BUT DIPS AND SUSPECTED FAULTING BELOW 240 M. DATA BELOW THIS DEPTH CONSIDERED UNRELIABLE.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:>240 Base Elevation: -86# Thickness: >116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks RANGAL CM. BASE OF HOLE AT 268 M BUTDIPS AND SUSPECTED FAULTING BELOW 240 M. DATA BELOW THIS DEPTH CONSIDERED UNRELIABLE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:124 Base Elevation: 30 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:191 Base Elevation: -37 Thickness: 67
Geologic Description: F-M ARENITE, MDST, SLTST, SH, COAL, XL TONSTEIN. X-BDD, INCLINED BDG, MED BDD. CARB FOSSIL WOOD FRAG. BRECCIATIED, SLICKS, FRACTURED.
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, U MIDDLEMOUNT	136.45	17.55	3.52
TONSTEIN	161.93	-7.93	<1
COAL, U TRALEE SM	163	-9	1
COAL, L TRALEE SM	170.1	-36.1	4.67

Tectonic Structure: DIPS 4-15 DG(NO THICK CORRECTION)
Remarks: RANGAL-BURNGROVE BOUNDARY OF ANDERSON AND JAMESON IS HIGHER IN SEQUENCE THAN IN PREVIOUS GSQ RECORDS. ROPER SM 126M <1)

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -114* Thickness: >77
Geologic Description: F-C ARENITE, MDST, SLTST, TUFF, CARB, TFAC, PLANT FOSS, WOOD FRAG, MDST PBLS AND CLASTS. XBDD, MED BDD, BRECCIATED, SLICKS, FRACTURES
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF, YARRABEE TF BD	193	-39	1

Tectonic Structure: DIPS 3-60 DG(NO THICK CORRECTION)
Remarks: RANGAL-BURNGROVE BOUNDARY OF ANDERSON AND JAMESON IS HIGHER IN SEQUENCE THAN USED IN PREVIOUS GSQ RECORDS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -114* Thickness: >144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: RANGAL CM, BURNGROVE FM.

CONTROL POINT: ROSELLA CREEK 1

REFERENCE \ B7

	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
	TARGET EXPL.	RDH, CORED, WIRELINE	SF/55-3	28 52'00"S	147 51'30"E	+181	+184	-418	602	

REFERENCE: TARGET EXPLORATION PTY LTD
T.E.P.L ROSELLA CREEK NO.1 WELL COMPLETION REPORT
TARGET EXPLORATION PTY LTD REPORT NO. Q/167P/2 UNPUBL Page Publn Year: 1971
Cross Reference: DICKINS AND MALONE 1973 BMR BULLETIN 130, 49,57

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -418 Thickness:)88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION IS -185 M. VALUES USED IN CONTOUR MAPPING.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:369 Base Elevation: -185 Thickness: 345
Geologic Description: VF-F GY SST, LT GY-BROWNISH SLTST, INTBDD LT GY SILTY SH AND GY SLTST (BIG STROPH ZONE), AND RHY TOWARDS TOP; FOSS ABUNDANT IN BS ZONE)
Reported Environment: BELOW WAVE BASE IN MODERATELY SHALLOW SEA. WELL AERATED AND UNRESTRICTED (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BIG STROPHALOSIA ZNE	179	+5	26
VOLCANICS, RHYOLITE			

Tectonic Structure: DIPS 0-20 DG
Remarks NO APPARENT DIP CORRECTION

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -418 # Thickness:)801
Geologic Description: INTBDD F-VF GY-BR SST, GY CARB SLTST, AND INTBDD GY-BR SANDY CALC SLTST, CARB SST, AND GY-BLK SILTY SH; SOME FOSSILS
Reported Environment: COASTAL SWAMPS, DELTAIC FLOOD PLAIN (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
QZITE PEBBLE ZONE	411	-227	11

Tectonic Structure: DIPS OF 70 AND 75 DG RECORDED
Remarks THICKNESS CORRECTED FOR 70 DG DIP

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -418 # Thickness:)80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -418 # Thickness:)446
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFF BLENHEIM SUB-GROUP AND COLLINSVILLE CM OF GEBBIE SUB-GR.

CONTROL POINT : RUGBY BORE

REFERENCE # B34

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	BORE	SF/55-11	22 06'29"S	147 50'22"E	+298	+298	+146	144	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page 21; PL 13 Publn Year: 1964

Cross Reference: STAINES HRE AND KOPPE WH 1979, QLD GOVT MINING JOURNAL 80, 179

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: 146 Thickness:)49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: 146 Thickness:)49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 290 M. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +146 # Thickness:)49
Geologic Description: ARENITE WITH COALY BANDS AND COAL
Reported Environment: NON-MARINE FACIES OF A DELTA SYSTEM (STAINES AND KOPPE, 1979)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	97	+193	2
COAL	144	+146	10

Tectonic Structure:
Remarks OVERLAIN BY WATER

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +146 # Thickness:)49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLLINSVILLE COAL MEASURES.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +146 # Thickness:)49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLLINSVILLE CM OF GEBBIE SUB-GROUP.

CONTROL POINT: STATE RESERVE 2, 26

REFERENCE # B1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-3	20 35'00"S	147 45'00"E	+160	+160	-54	214	

REFERENCE: REID, J.H.
GEOLOGY OF THE BOWEN RIVER COALFIELD
GEOLOGICAL SURVEY OF QUEENSLAND PUBLICATION NO. 276 Page Publn Year: 1929

Cross Reference: WEBB AND CRAPP 1968 PROC AIMM 193, 58 MALONE ET AL 1966, BMR REPORT NO.100, TABLE 1

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -54 Thickness:) 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 138 M. VALUES USED IN CONTOUR MAPPING.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:22 Base Elevation: +138 Thickness: 22
Geologic Description: SST AND SLTST WITH ERRATIC PEBBLES AND COBBLES; FOSSILIFEROUS (WEBB AND CRAPP, 1968)
Reported Environment: MODERATELY DEEP TO SHALLOW WATER; TRANSGRESSIVE PHASE (MOLONE, ET.AL., 1966)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: LOW DIPS (ABOUT 5 DG)
Remarks

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -54 * Thickness:)192
Geologic Description: SST, COAL, SLTST, SH, AND CGL; QZ SST AND QZ GWKE WITH SLTST (GLENDOO SST MB). (MALONE, ET.AL., 1966)
Reported Environment: DELTAIC OR PALUDAL; GLENDOO SST MB FORMED DURING MARINE TRANSGRESSION. (MALONE ET AL, 1966)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	53	+107	5
MARINE BD	103	+57	8
COAL, 3 SMS (< 2 M)	131	+29	16
COAL AND INTRUSIVE	162	-2	7

Tectonic Structure: LOW DIPS (ABOUT 5 DG)
Remarks COAL AND INTRUSION AT 212 M DEPTH (-52 MSL) IS 10 M THICK

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -54 * Thickness:)192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -54 * Thickness:)214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONTAINS UNDIFF BLENHEIM SUB-GROUP AND THE COLLINSVILLE CM OF THE GEBBIE SUB-GR.

CONTROL POINT: TAY GLEN 21/1-5

REFERENCE # 858

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-11	22 31'83"S	148 19'17"E	+197 ?	+197 ?	-47	244	

REFERENCE: VEEVERS, J.J., RANDAL, M.A., MOLLAN, R.G., AND PATEN, R.J.
GEOLOGY OF THE CLERMONT 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 66 Page 28; PL 13 Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BACK CREEK GP. Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -47 ± Thickness:)244
Geologic Description: INTBDD QZ GREYWACKE AND THIN BEDS OF FINE GREYWACKE AND MICAC OR CARB SLTST; GREYWACKE XBDD; TRAILS, ORG DISTUR, PLANT DETRITUS, MARINE FOSSIL
Reported Environment: MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
NARTINIOPSIS BRACHS	22	+175	
PELECYPODS	240	-43	

Tectonic Structure: DIPS 0-8 DG
Remarks PELECYPOD BED BELIEVED TO LIE IMMEDIATELY ABOVE CLARKEI BED. CONSISTS OF UNDIFFERENTIATED BACK CREEK GROUP

CONTROL POINT: TURRAWALLA RJS

REFERENCE # B14

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-7	21 89'06"S	148 14'53"E	+275	+275	-3 ?	278 ?	

REFERENCE: MALONE, E.J., CORBETT, D.W.P., AND JENSEN, A.R.
GEOLOGY OF THE MOUNT COOLON 1:250,000 SHEET AREA
BUREAU OF MINERAL RESOURCES REPORT NO. 64 Page 24, PL 1,3 Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -3 * Thickness:)72
Geologic Description: F-C GRAINED QZ SST (OCCASIONALLY PEBBLY), AND MICAC SLTST; INTBDD IN PLACES; SLTST FOSSILIFEROUS AND CONTAINS FOSSIL WOOD.
Reported Environment: MARINE AND MODERATELY DEEP WATER.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 85-86 DEGREES WSW
Remarks TOTAL DEPTH DETERMINED BY CALCULATING APPARENT VERTICAL THICKNESS FOR 85 DG DIP.

CONTROL POINT: UTAH 13459

REFERENCE # B30

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UTAH DEVEL. CO.	DDH	SF/55-7	21 53'19"S	147 59'41"E	+248	+248	-38 CA	278 CA	

REFERENCE: WALLIN, C.I., AND KOPPE, W.H.
AN EVALUATION OF COAL RESOURCES IN THE MORANBAH AREA, CENTRAL QUEENSLAND
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/49 Page B-9;F2,5,8 Publn Year: 1978

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -38 * Thickness:)242
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:36 Base Elevation: +284 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -38 * Thickness:)242
Geologic Description: LABILE SANDSTONE, SHALE, MUDSTONE, AND COAL
Reported Environment: FLUVIAL FLOOD PLAIN; STREAM CHANNELS, SHALLOW LAKES, SWAMPS, AND CREVASSE SPLAY DEPOSITS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, U.GOONYELLA SM	96	+144	3
COAL, P SMS (< 1 M)	161	+79	42
COAL, HARROW CK SM	206	+34	5
COAL DYSART SM (L)	276	-36	7

Tectonic Structure:
Remarks OTHER THIN COALS PRESENT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -38 * Thickness:)242
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MORANBAH CM.

CONTROL POINT: WEST HAVILAH

REFERENCE # B6

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-3	20 48'37"S	147 44'37"E		+140	-676	816	

REFERENCE: MALONE, E.J., JENSEN, A.R., GREGORY, C.M., AND FORBES, V.R.
GEOLOGY OF THE SOUTHERN HALF OF THE BOWEN 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 100 Page 31-40;PL 5 Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:815 Base Elevation: -675 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -404. VALUES USED FORT CONTOUR MAPS

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:544 Base Elevation: -404 Thickness: 544
Geologic Description: QZ GREYWACKE GRADING TO COARSE SLTST, THIN CGL BANDS AND SCATTERED PEBBLES AND BOULDERS; INCLUDES BIG STROPHALOSIA ZONE
Reported Environment: MARINE, NOT SHALLOW
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
BIG STROPHALOSIA ZN 433 -293
Tectonic Structure: DIPS OF 5 DG AND <15 DG RECORDED
Remarks SECTION IS PROJECTED UNDERNEATH YOUNGEST ROCKS, I.E. TOP OF BLENHEIM SUB-GP

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:815 Base Elevation: -675 Thickness: 271
Geologic Description: SANDSTONE, SILTSTONE AND COAL; GLENDOO SANDSTONE MEMBER EQUIVALENT CONSISTS OF QZ GREYWACKE AND SILTSTONE
Reported Environment: DELTAIC OR PALUDAL; GLENDOO SST MB FORMED DURING MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
GLENDOO SST MEMBER TD >117
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:815 Base Elevation: -675 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLLINSVILLE CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:815 Base Elevation: -675 Thickness: 815
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM SUB-GP AND COLLINSVILLE CM OF GEBBIE SUB-GP

STRATIGRAPHY: LIZZIE CREEK VOLC Age: PERMIAN Interpretation Code: Yi05
Basal Information: Depth to Base: TD Base Elevation: -676± Thickness:)1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WODEHOUSE NS 4

REFERENCE # B23

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-7	21 27'19"S	148 28'04"E	+270	+270	-98	368	

REFERENCE: KOPPE, W.H.
DEPARTMENTAL DRILLING, EXMOOR AND HAIL CREEK EAST, NORTH BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/6 Page 6-8,11-12 Publn Year: 1973
Cross Reference: KOPPE, W.H. 1974, QLD GOVT MINING JOURNAL 75, 283

SEDIMENTARY BASIN: BOWEN, NORTH

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:171 Base Elevation: +99 Thickness: >154
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: MORANBAH CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:171 Base Elevation: +99 Thickness: 154t
Geologic Description: LAB TO SUB-LAB SST WITH CONGLOMERATE, SLTST, MDST, COAL, CARB SH, AND BRECCIA; CARB FRAGMENTS AND PLANT FOSSILS.
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	29	+241	3
COAL	63	+207	1.5
COAL	84	+186	1
COAL	90	+180	1

Tectonic Structure: DIPS 20-32 DEGREES
Remarks THICKNESS CORRECTED FOR AVG DIP OF 26 DG

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:171 Base Elevation: +99 Thickness: 154
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MORANBAH CM

STRATIGRAPHY: EXMOOR FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:282 Base Elevation: -12 Thickness: 102t
Geologic Description: SUB-LAB GREY SST WITH GREY-DK GREY SLTST AND SHALE; MICAC; SMALL SCALE SLUMPING; CARB FRAGMENTS; PLANT FOSSILS; BIOTURBATION.
Reported Environment: SHALLOW AND NEAR SHORE MARINE. (VARIETY OF NEAR SHORE ENVIRONMENTS; DECLINING MARINE INFLUENCE - KOPPE, 1974)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL AND COKED COAL	179	+91	3

Tectonic Structure: DIPS 22-25 DG
Remarks THICKNESS CORRECTED FOR 23 DG DIP

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -98 * Thickness: >181t
Geologic Description: BOTTOM 79 M: QZ SST WITH AREN SLTST; SST MICAC AND BIOTURBATED; SLTST PYRITIC AND CONTAINS CRINOIDS IN BASAL PART; MINOR CGL; TOP: SEE EXMOOR FM
Reported Environment: MARINE; SHELTERED, QUIESCENT WATER (BASAL 79 M). NEAR SHORE MARINE IN TOP(EXMOOR FM)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure: DIPS 20-25 DG IN LOWER PART; 22-25 TOP
Remarks: CONTAINS EXMOOR FM IN TOP 102 M AND UNDIFFERENTIATED BLENHEIM SUB-GR BELOW. THICKNESS CORRECTED TO TRUE DIP.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code: Yi15
Basal Information: Depth to Base: TD Base Elevation: -98 # Thickness:)181
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BLENHEIM SUB-GR (EXMOOR FM AND UNDIFFERENTIALED BLENHEIM SUB-GR)

BOWEN

BASIN

CENTRAL

CONTROL POINT: BLACKWATER 1

REFERENCE # B93

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BROKEN HILL PTY.	DDH, CORE + WIRELINE	SF/55-16	23 44'00"S	148 50'00"E	213	213	-128	341	

REFERENCE: BROKEN HILL PTY. CO. LTD.
BHP BLACKWATER NO. 1 BORE COMPOSITE LOG AND LITHOLOGIC DESCRIPTION
UNPUBLISHED COMPANY RECORDS Page Publn Year:

Cross Reference: MALONE, E.J, OLGERS, F, AND KIRKEGAARD, A.G, 1969, BUREAU OF MINERAL RESOURCES R
EPORT NO. 121, FIG. 17, P. 58.

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: TRIASSIC Age: TRASSIC Interpretation Code:X
Basal Information: Depth to Base:269 Base Elevation: -56 Thickness:)269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -128 # Thickness:)72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -128 # Thickness:)72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: SAGITTARIUS SST Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:269 Base Elevation: -56 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:269 Base Elevation: -56 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SAGITTARIUS SST

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:TD Base Elevation: -128# Thickness:)72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y1#4
Basal Information: Depth to Base:TD Base Elevation: -128# Thickness:)72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL CM

CONTROL POINT: BLACKWATER NS 112

REFERENCE # B91

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-16	23 33'37"S	148 51'22"E	+176	+178	-178	356	

REFERENCE: STAINES, H.R.E.
COAL EXPLORATION SOUTH CENTRAL BOWEN BASIN JELLINBAH-BLACKWATER AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/10 Page FIG A4 Publn Year: 1977

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:103 Base Elevation: +75 Thickness:)102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -178 # Thickness:)111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -178 # Thickness:)253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:103 Base Elevation: +75 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:245 Base Elevation: -67 Thickness: 142?
Geologic Description: GREY MUDSTONE AND SILTSTONE, LT GREY FINE LITHIC SANDSTONE, AND COAL. PLANT FOSSILS IN MDST (GLOSSOPTERIS-GANGAMOPTERIS, SPHENOPTERIS)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, CASTOR SM	144	+34	3.9
COAL, POLLUX SM	160	+18	2.5
COAL, ORION SM	183	-5	2.2
COAL, PICES ? SM	221	-43	6.2

Tectonic Structure: MDSTLY (5 DG DIP. 2 INTERVALS 40-60 DG.

Remarks: DRAMATIC CHANGE IN DIP AT ABOUT 170 M AND 214-221 M DEPTH. FAULT BRECCIA BELOW LATTER INTERVAL.

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -178 * Thickness: >111
Geologic Description: LT GN AND GY MDST AND SLTST WITH FINE SST, COAL, AND CARB MDST. TFAC MDST ASSOCIATED WITH COAL. CHERTY FOSS LEAF BDS AND CALC SECTIONS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, VIRGO SM	252	-74	6.7
COAL	288	-110	4

Tectonic Structure: DIPS 1-2 DC
Remarks: GREEN MOTTLING IS DISTINCTIVE. PLANT FOSS INCL GLOSSOPTERIS, GANGAMOPTERIS, VERTEBRARIA, EQUISETALEAN STEMS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -178 * Thickness: >253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS RANGAL CM AND BURNGROVE FM.

CONTROL POINT: BLACKWATER NS 176

REFERENCE # B72

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-16	23 13'40"S	148 36'10"E	+170	+170	-200	370	

REFERENCE: PROUZA, V.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN MT STUART-COMET AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/27 Page FIG 5 Publn Year: 1977

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:151 Base Elevation: +19 Thickness:)151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -200 ± Thickness:)167
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:151 Base Elevation: +19 Thickness: 151
Geologic Description: SUB-LAB TO LI-LAB SST, AND COAL. MINOR SLTST AND MDST. CYCLOTHEMS WITH THICK DIRTY COAL WITH NUM INTBDS. PLANT FOSS AND RARE MARINE FOSS AT BASE
Reported Environment: DELTAIC, FLUVIAL, PALUDAL, PARTLY MARINE AT BASE (TRANSITIONAL). DEPOSITION IN CHANNELS, BARS, ALLUVIAL AND COASTAL PLAINS, COAL SWAMPS, BEACHES
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFFS, NUM BDS T'OUT			
COAL, CANIS SM	79	+91	10
COAL, LEPUS SM	102	+68	4.75
COAL FAIR HILL SM	128	+42	5.2

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:151 Base Elevation: +19 Thickness: 151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:203 Base Elevation: -33 Thickness: 52
Geologic Description: UPPER PART OF INTBDD MDST AND SLTST WITH MINOR SST; ORG BURROWS. MIDDLE OF DK MDST WITH TUFFS AND MARINE FOSS. BASAL SST HAS MARINE FOSS DEBRIS
Reported Environment: LOWER SECTION TRANSGRESSIVE WITH LITTORAL-OPEN MARINE ENVIRONMENTS. REGRESSIVE SEQUENCE ABOVE DEPOSITED ON TIDAL FLATS, ALLUVIALFANS, CHANNELS.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -280 ± Thickness: >167
Geologic Description: SUB-LAB SST, MINOR SLTST AND MDST, COAL SMS. GLOSSOPTERIS-GANGAMOPTERIS ASSEMBLAGE. ORG BURROWS. TUFFS ASSOCIATED WITH COALS.
Reported Environment: DELTAIC, FLUVIAL, PALUDAL. DEPOSITED IN FLUVIAL CHANNELS, ALLUVIAL FANS, TIDAL FLATS, AND COAL SWAMPS.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, PLEIDES SM	208	-38	0.7
COAL TIERI 1, 11 SMS	274	-104	10
COAL, CORVUS SM	309	-139	1
COAL, GERMAN CK SM	343	-173	0.7

Tectonic Structure:
Remarks CLEAN, GOOD COKING COAL. BIOT TF WITH PLEIDES SM; TFAC INTBDS IN OTHER SMS. TIERI SMS EACH 0.7 M THICK.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -200 ± Thickness: >219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -200 ± Thickness: >219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS OF BLENHEIM SUB-GP.

CONTROL POINT: BLACKWATER NS 181

REFERENCE # B98

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-16	23 31'15"S	148 40'80"E	+170	+178	-220	390	

REFERENCE: PROUZA, V.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN MT STUART-COMET AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/27 Page FIG 5 Publn Year: 1977

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:89 Base Elevation: +81 Thickness:)89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:89 Base Elevation: +81 Thickness:)89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION.

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:306 Base Elevation: -136 Thickness: 151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:89 Base Elevation: +81 Thickness: 89
Geologic Description: SUB-LAB TO LI-LAB SST, COAL, AND MINOR SLTST AND MDST. CYCLOTHEMS WITH THICK DIRTY COAL WITH NUMEROUS INTBDS. PLANT FOSS, RARE MARINE FOSS(BASE)
Reported Environment: DELTAIC, FLUVIAL, PALUDAL, PARTLY MARINE AT BASE (TRANSITIONAL). DEPOSITION IN CHANNELS, BARS, ALLUVIAL AND COASTAL PLAINS, COAL SWAMPS, BEACHES
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF, NUMEROUS BEDS			
COAL, CANIS SM	43	+127	9.6
COAL, LEPUS SM	58	+112	1.9
COAL, FAIR HILL SM	77	+93	3

Tectonic Structure:
Remarks CANIS SM CONSISTS OF ABOUT 35% COAL, 23% CARB SHALE, AND 42% TFAC MDST.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:89 Base Elevation: +81 Thickness: 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:155 Base Elevation: +15 Thickness: 65
Geologic Description: UPPER PART OF INTBDD MDST AND SLTST WITH MINOR SST; ORG BURROWS. MIDDLE OF DK MDST WITH TUFFS; MARINE FOSS. BASAL SST WITH MARINE FOSS DEBRIS.
Reported Environment: LOWER SECTION IS TRANSGRESSIVE WITH LITTORAL-OPEN MARINE ENVIRONMENTS. REGRESSIVE SEQUENCE ABOVE DEPOSITED ON TIDAL FLATS,ALLUVIAL FANS,CHANNELS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:306 Base Elevation: -136 Thickness: 151
Geologic Description: SUB-LAB, SOME QZOSE SST, MINOR SLTST AND MDST, RARE THIN COAL SMS, RARE WHITISH TF AT TOP. A FEW PLANT FOSS, ORG BURROWS, RARE MARINE FOSS.
Reported Environment: PARTLY FLUVIAL, PARTLY DELTAIC, MINOR MARINE. DEPOSITED IN CHANNELS. ALLUVIAL FANS, TIDAL FLATS, COAL SWAMPS. REGRESSIVE, MINOR MARINE INCURSION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, TIERI II SM	245	-75	0.6
COAL, GERMAN CK SM	292	-122	0.4

Tectonic Structure:
Remarks COAL GENERALLY CLEAN BUT VERY THIN

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -200 ± Thickness: >84
Geologic Description: UPPER PART OF MDST AND SOME SLTST, MINOR SST INTBDS; ORG BURROWS. LOWER PART OF DK MDST.
Reported Environment: LOWER TRANSGRESSIVE SEQUENCE OF FULLY MARINE, NERITIC ENVIRONMENTS. UPPER TRANSITIONAL AND REGRESSIVE SEQUENCE DEPOSITED ON TIDAL FLATS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -220 ± Thickness: >301
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN, CROCKER, AND MARIA FMS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -220 ± Thickness: >301
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN, CROCKER, AND MARIA FMS OF BLENHEIM SUBGROUP.

CONTROL POINT: BLACKWATER NS 191

REFERENCE # B79

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-16	23 24'12"S	148 32'04"E	+228	+229	-130	359	

REFERENCE: PROUZA, V.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN MT STUART-COMET AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/27 Page FIG 5 Publn Year: 1977

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:263 Base Elevation: -34 Thickness: >262
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -130 # Thickness: >57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:99 Base Elevation: +131 Thickness: 98
Geologic Description: BASAL DK MDST WITH TUFFS FOLLOWED BY INTBDD DK MDST AND GY SLTST WITH TUFFS AND ORG BURROWS. OVERLAIN BY GREEN MOTTLED SLTST, MDST, SST. PLT REM
Reported Environment: REGRESSIVE SEQUENCE OF BASAL LAGOONAL FACIES, TIDAL FLAT DEPOSITION; UPPER SUBAERIAL LACUSTRINE AND FLUVIAL (ALLUVIAL FAN) ENVIRONMENTS.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DESCRIPTION FOR LOWER, NON-COAL BEARING BURNGROVE FM.

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:263 Base Elevation: -34 Thickness: 164
Geologic Description: SUB-LAC TO LITHIC-LAB SST, COAL, AND MINOR SLTST AND MDST. CYCLOTHEMS WITH THICK DIRTY COAL WITH NUM INTBDS. PLANT FOSS, RARE MARINE FOSS BASE.
Reported Environment: DELTAIC, FLUVIAL, PALUDAL, PARTLY MARINE AT BASE (TRANSITIONAL). DEPOSITION IN CHANNELS, BARS, ALLUVIAL AND COASTAL PLAINS, COAL SWAMPS, BEACHES
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HERCULES SM	169	+61	9.7
COAL, CANIS SM	200	+29	8.5
COAL, LEPUS SM	224	+5	6.7
COAL, FAIR HILL SM	241	-12	6.8

Tectonic Structure:
Remarks PEGASUS COAL SM AT 133 M DEPTH (+96 MSL) IS 2.6 M THICK. NUM TUFF BDS.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:263 Base Elevation: -34 Thickness: 262
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS BURNGROVE AND FAIR HILL FMS

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:302 Base Elevation: -73 Thickness: 39
Geologic Description: UPPER SEQ OF INTBDD MDST AND SLTST WITH MINOR SST; ORG BURROWS. MIDDLE SEQ OF DK MDST WITH MARINE FOSS AND TF. BASAL SST WITH MARINE FOSS DEBRIS
Reported Environment: TRANSGRESSIVE LOWER SECTION WITH LITTORAL-OPEN MARINE ENVIRONMENTS. REGRESSIVE SEQ ABOVE DEPOSITED ON TIDAL FLATS, ALLUVIAL FANS, CHANNELS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -130 ± Thickness: >57
Geologic Description: SUB-LAB SANDSTONE, MINOR SILTSTONE, AND MUDSTONE WITH COAL SMS AND ASSOCIATED TF. ORG BURROWS, GLOSSOPTERIS-GANGAMOPTERIS ASSEMBLAGE.
Reported Environment: DELTAIC, FLUVIAL, PALUDAL. DEPOSITED IN FLUVIAL CHANNELS, ALLUVIAL FANS, TIDAL FLATS, AND COAL SWAMPS.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, AQUILA SM 324 -95 0.2
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -130 ± Thickness: >96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -130 ± Thickness: >96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS OF BLENHEIM SUB-GROUP.

CONTROL POINT : BLACKWATER NS 198

REFERENCE # B63

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-15	23 02'00"S	148 28'60"E	+191	+192	+70	122	

REFERENCE: PROUZA, V.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN OAKY CREEK AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/5 Page Publn Year : 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:30 Base Elevation: +162 Thickness: 29
Geologic Description: DK GREY AND SILTY MDST, MICACEOUS; SOME ORG BURROWS
Reported Environment: TRANSGRESSIVE PHASE. NERITIC WITH EUXINIC CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: VERY LOW DIPS
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +70 * Thickness:)90
Geologic Description: DK GREY AND SILTY MDST, MINOR SLTST, QZ SST. LAMINATED, BIOTURBATED. RARE MARINE FOSSILS.
Reported Environment: LITTORAL TO FLUVIAL OR DELTAIC.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: VERY LOW DIPS
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +70 * Thickness:)121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS INGELARA AND FREITAG FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +70 * Thickness:)121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS INGELARA AND FREITAG FMS OF GEBBIE SUB-GROUP.

CONTROL POINT: BLACKWATER NS 9

REFERENCE # B77

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-16	23 21'52"S	148 53'00"E	+126	+127	-208	335	

REFERENCE: STAINES, H.R.E.
COAL EXPLORATION SOUTH CENTRAL BOWEN BASIN JELLINBAH-BLACKWATER AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/10, VOLUME A AND B Page FIG A-1 Publn Year: 1977

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:34 Base Elevation: +113 Thickness:)33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -208 ± Thickness:)138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -208 ± Thickness:)311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TRIAS-CAIN Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:24 Base Elevation: +103 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE EXTRAPOLATED FROM CORRELATION DIAGRAM (NOT GIVEN ON STRAT LOG) BASE IS TRIASSIC

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:197 Base Elevation: -70 Thickness: 173
Geologic Description: GREY MUDSTONE AND SILTSTONE, LT GREY FINE LITHIC SANDSTONE, AND COAL. PLANT FOSS IN MDST: GLOSSOPTERIS, GANGAMOPTERIS, SPHENOPTERIS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, CANCER SM	36	+91	3.6
COAL, MAMMOTH SM	65	+62	3
COAL, POLLUX-ORION ?	131	-4	3.6
COAL, PICES SM	150	-23	4.2

Tectonic Structure: DIP <10 DG

Remarks NO CORRECTION FOR APPARENT THICKNESS

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -288 ± Thickness:)138
Geologic Description: LT GREEN AND GREY MDST AND SLTST WITH FINE SST, COAL, AND CARB MDST. TFAC MDST ASSOCIATED WITH COAL. CHERTY FOSS LEAF BDS AND CALC SECTIONS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, VIRGO SM	283	-76	6.4
COAL, LEO SM	250	-123	5
COAL, AQUARIUS SM	273	-146	3.6
COAL, SCORPIO SM	326	-199	5.2

Tectonic Structure: DIPS <5 DG
Remarks GREEN MOTTLING IS DISTINCTIVE. LIBRA COAL SM AT 221 M DEPTH (-94 MSL) IS 1.8 M THICK

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -288 ± Thickness:)311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL CM AND BURNGROVE FM

CONTROL POINT: CAIRNS COUNTY NS 26

REFERENCE # B64

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-15	23 07'31"S	148 28'85"E	+214	+214	-90	304	

REFERENCE: ZILLMAN, N.J.
COAL RESOURCES SOUTH CENTRAL BOWEN BASIN, OAKY CREEK AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/27 Page Publn Year: 1976

Cross Reference: PARK WJ 1973, GEOL. SURV. QLD. RECORD 1973/28, 8-9

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:40 Base Elevation: +174 Thickness:)39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -90 ± Thickness:)210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:40 Base Elevation: +174 Thickness:)39
Geologic Description: LT GREY SILTSTONE, MUDSTONE, ARENITE
Reported Environment: FRESHWATER (PALUDAL - PARK, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:40 Base Elevation: +174 Thickness:)39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:94 Base Elevation: +120 Thickness: 54
Geologic Description: DK GREY TO BLACK MDST AND SLTST WITH MINOR F-M GRAINED ARENITE; TWO MARINE FOSSIL HORIZONS; BIOTURBATION
Reported Environment: TRANSITIONAL TO NERITIC (MARINE)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MARINE FOSSILS	73	+141	
MARINE FOSSILS	94	+120	

Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y184
Basal Information: Depth to Base:TD Base Elevation: -90 * Thickness:)210
Geologic Description: MOSTLY ARENITE WITH MINOR SLTST AND MDST, WELL DEVELOPED COAL SEAMS IN UPPER PART; PLANT FOSSILS; WORM BURROWS
Reported Environment: LOWER PART MOSTLY TERRIGENOUS WITH MINOR MARINE INCURSIONS. UPPER PART IS TERRIGENOUS TO MARSHY
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, AQUILA, SM	135	+79	<1
COAL, TIER1 (1) SM	157	+57	<1
COAL	168	+46	<1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:TD Base Elevation: -90 * Thickness:)264
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -90 * Thickness:)264
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS OF BLENHEIM SUB-GP.

CONTROL POINT: COMET 1

REFERENCE # B92 Y1
REFERENCE # B92 Y2
REFERENCE # B92 Y3
REFERENCE # B92 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH, CORE + WIRELINE	SF/55-16	23 40'30"S	148 37'45"E	+240	+244	-673	917	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.F.O. COMET NO. 1 WELL, QUEENSLAND. WELL COMPLETION REPORT
UNPUBLISHED WELL COMPLETION REPORT NO. Q/55-56P/252 (BMR FILE 65/4140) Page Publn Year: 1965
Cross Reference: DEVINE AND POWER, 1967, QGMJ VOL 68

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130 Page P114;TB 5 Publn Year: 1973
Cross Reference:

REFERENCE: Y3
POWER, P.E.
GEOLOGY AND HYDROCARBONS, DENISON TROUGH, AUSTRALIA
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, BULLETIN VOLUME 51, NO.7 Page P1320-1345 Publn Year: 1967
Cross Reference: DEVINE, S.B., & POWER, P.E., 1967, QGMJ VOL 68, P109-116.

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:306 Base Elevation: -62 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:535 Base Elevation: -291 Thickness: 229
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:11 Base Elevation: +233 Thickness: 7
Geologic Description: SUPERFICIAL DEPOSITS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: ELEVATION RECALCULATED FROM WELL REPORT TO SF/55-16. WELL REPORT GIVES GROUND ELEVATION OF 183 M

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:265 Base Elevation: -21 Thickness: 254

Geologic Description: SST AND SH. BASAL BLK, CARB, MICAC SH THAT BECOMES BROWNISH, CALC, AREN, TOWARD BASE. SST IS F-M GRAINED, POOR SORT, QZOSE, AND SILICIFIED
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PEAWADDY EQUIVALENT	210	+34	199
CATHERINE SST EQUIV.	218	+26	8
INGELARA SH EQUIV.	265	-21	47
P3B SPORES	229	+15	

Tectonic Structure:
Remarks: PEAWADDY=DRY CREEK SH, CATHERINE=EARLY STORMS SST. INGELARA AND CATHERINE CORRELATED BY WIRELINE TO ARCTURUS NO. 1 WELL

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:265 Base Elevation: -21 Thickness: 254
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MARIA FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:588 Base Elevation: -344 Thickness: 323
Geologic Description: THICK SEQUENCES OF QZITE; THINNER INTERVALS OF LITHIC TO SUB-LAB SST WITH COAL GRAINS AND VARYING ARG, CALC, PY CONTENT. CARB SH IN BOTTOM
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PRE-P3B ASSEMBLAGE	300	-56	
PRE-P3B ASSEMBLAGE	491	-247	
PRE-P3B ASSEMBLAGE	575	-331	

Tectonic Structure:
Remarks:

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:588 Base Elevation: -344 Thickness: 323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:717 Base Elevation: -473 Thickness: 129
Geologic Description: DARK GREY CARB, MICAC, PY SHALE WITH SUBORDINATE GREYWACKE AND QZ SST IN LOWER SECTION. CONTAINS BRYOZOANS AND SHELL FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE (BRYOZOAN)	682	-438	2
P2 ASSEMBLAGE	617	-372	
P2 ASSEMBLAGE	712	-468	

Tectonic Structure:
Remarks:

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:717 Base Elevation: -473 Thickness: 129
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:

Remarks CONTAINS CATTLE CREEK FM.

STRATIGRAPHY: JACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:717 Base Elevation: -473 Thickness: 706
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MARIA FM OF BLE[illegible]IM SUB-GP, ALDEBARAN SST OF GEBBIE SUB-GP, CATTLE CREEK FM OF TIVERTON SUB-GP

STRATIGRAPHY: BASEMENT Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -673 + Thickness:)200
Geologic Description: ALTERED PYROCLASTICS. CONTAINS LOWER PERMIAN MICROFOSSILS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feato Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:210 Base Elevation: +34 Thickness: 206
Geologic Description: SEE COMET 1 Y102: MARIA FM (PEAWADDY CORRELATIVE)
Reported Environment: MARINE TRANSGRESSIVE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PEAWADDY + CATHERINE + INGELARA = MARIA FM (WELL REPORT Y1)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:210 Base Elevation: +34 Thickness: 206
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Fe Depth Elevation Thickness
Tectonic Structure:
Remarks CO[illegible]INS PEAWADDY FM

STRATIGRAPHY: CA[illegible]HERINE SST Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:219 Base Elevation: +25 Thickness: 9
Geologic Description: [illegible]E COMET 1 Y102: MARIA FM (CATHERINE CORRELATIVE)
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:267 Base Elevation: -23 Thickness: 47
Geologic Description: SEE COMET 1 Y102: MARIA FM (INGELARA CORRELATIVE)
Reported Environment: RELATIVELY DEEP MARINE WITH LITTLE REWORKING OF SEDIMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:588 Base Elevation: -344 Thickness: 323
Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH ENVIRONMENTS WHICH GRADUALLY REPLACED MARINE CATTLE CREEK

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:588 Base Elevation: -344 Thickness: 379
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM, ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:718 Base Elevation: -474 Thickness: 130
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:718 Base Elevation: -474 Thickness: 130
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:718 Base Elevation: -474 Thickness: 715
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GP (PEAWADDY), GEBBIE SUB-GP (CATHERINE, INGELARA, ALDEBARAN), TIVERTON SUB-GP (CATTLE CREEK).

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:TD Base Elevation: -673 + Thickness:)200
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:146 Base Elevation: +98 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y302

Basal Information: Depth to Base:146 Base Elevation: +92 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MARIA FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:221 Base Elevation: +23 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:267 Base Elevation: -23 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:306 Base Elevation: -62 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:535 Base Elevation: -291 Thickness: 229
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:535 Base Elevation: -291 Thickness: 390
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM, FREITAG FM, ALDEBARAN SST.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:729 Base Elevation: -485 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:729 Base Elevation: -485 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:729 Base Elevation: -485 Thickness: 721
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GP (MARIA), GEBBIE SUB-GP (CATHERINE, INGELARA, FREITAG, ALDEBARAN), TIVERTON SUB-GP (CATTLE CREEK FM).

STRATIGRAPHY: PYROCLASTIC SEDIMENT Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:TD Base Elevation: -673 # Thickness:)188
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: COORODRAH 1

REFERENCE # B67 Y1
REFERENCE # B67 Y2
REFERENCE # B67 Y3
REFERENCE # B67 Y4
REFERENCE # B67 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH, CORE, WIRELINE	SF/55-16	23 07'30"S	148 42'40"E	+191	+184	-890	1074	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
DERRINGTON, S.S.
FINAL REPORT A.F.O. NO. 2 (COORODRAH) EXPLORATION WELL
MINES ADMINISTRATION PTY. LIMITED UNPUBLISHED REPORT NO. Q/56P/82 Page Publn Year: 1960
Cross Reference: DICKINS, J.M, AND MALONE, E.J., 1973, BMR BULL. 130, P 114, TABLE 5 // PROUZA, V ., 1977, GSQ RECORD 1977/27, P 9.

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130 Page 114; TBL 5 Publn Year: 1973
Cross Reference:

REFERENCE: Y3
PROUZA, V.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN MT STUART-COMET AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/27 Page 9-10 Publn Year: 1977
Cross Reference:

REFERENCE: Y4
ARMAN, M.
PETROGRAPHY AND LITHOLOGICAL CORRELATION OF PERMIAN FORMATIONS IN A.F.O.INDERI NO. 1 AND A.F.O. COORODRAH NO. 1, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, RECORD 1965/226 (UNPUBLISHED) Page Publn Year: 1965
Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:94 Base Elevation: +90 Thickness:)87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X115
Basal Information: Depth to Base:94 Base Elevation: +90 Thickness:)87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF FAIR HILL FM.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:201 Base Elevation: -17 Thickness:
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X138
Basal Information: Depth to Base:494 Base Elevation: -310 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:43 Base Elevation: +141 Thickness: 40
Geologic Description: LT GREY-LT BROWN, F-C GRAINED, MICAC, ARG, SILTY AND SLIGHTLY CARB SST WITH MINOR INTBDS OF GREY-BROWN, MICAC, PY, MDST. NO FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MARIA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:370 Base Elevation: -186 Thickness: 328
Geologic Description: GY, F GRAINED, SILTY, MICAC, CARB SST AND DK GY, CARB, MICAC SLTST. BASAL PART CALC, PY, WITH MINOR MDST AND SH INTBDS. CRINOIDS, RARE PLT FOSS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COALY SECTION 52 +132 6
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:370 Base Elevation: -186 Thickness: 368
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CROCKER FM AND MARIA FM. POSSIBLY INCLUDES UNDERLYING ROCKS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:370 Base Elevation: -186 Thickness: 368
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS AT LEAST CROCKER FM AND MARIA FM OF BLENHEIM SUB-GP. POSSIBLY INCLUDES UPPER SILTSTONE, SANDSTONE, LOWER SLTST.

STRATIGRAPHY: UPPER SILTSTONE Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:499 Base Elevation: -315 Thickness: 129
Geologic Description: SLTST WITH SOME SST INTBDS. SLTST IS GY-DK GY, MICAC, FISSILE, IN PART ARGN, CALC, PY. QZ SST IS LT GY, F-VF GRAINED AND HARD. NO MACRO FOSSILS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO CATHERINE SST OF DICKINS AND MALONE.

STRATIGRAPHY: SANDSTONE Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 305
Geologic Description: LT GREY, F-VF GRAINED, SLIGHTLY CALC, HARD QZ SST THAT BECOMES SILTY, MICAC, PY IN BASAL 60 M. THIN INTBDS OF GY, SANDY, MICA SLTST OCCUR T'OUT.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO ALDEBARAN SST OF DICKINS AND MALONE. INFORMAL CHURCHSTONE SST IN WELL REPORT

STRATIGRAPHY: LOWER SILTSTONE Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 113
Geologic Description: SST AND SLTST WITH MINOR BL-GY MDST INTBDS. QZ SST IS LT GY, F-VF, HARD, PY, CALC. SLTST IS GY TO GY-BN, MICAC, SANDY, PY. PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO CATTLE CREEK FM OF DICKINS AND MALONE.

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y188
Basal Information: Depth to Base:TD Base Elevation: -890 ± Thickness: >156
Geologic Description: ANDESITIC TUFF, BRECCIA, ANDESITE, BASEMENT (METASEDIMENTS AND IGNEOUS)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
ANDESITIC TUFF	942	-758	24
BRECCIA	972	-788	30
ANDESITE	1030	-846	58
BASEMENT	TD		>44

Tectonic Structure:
Remarks EQUIVALENT TO PRE-PERMIAN OF DICKINS AND MALONE.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:119 Base Elevation: +65 Thickness: 116
Geologic Description:
Reported Environment: MARINE AND AT TIMES BRACKISH DELTA.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:369 Base Elevation: -185 Thickness: 250
Geologic Description:
Reported Environment: MARINE TRANSGRESSIVE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:369 Base Elevation: -185 Thickness: 366

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GERMAN CREEK AND PEAWADDY FMS.

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y284
Basal Information: Depth to Base:499 Base Elevation: -315 Thickness: 138
Geologic Description:
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y285
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 306
Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH REGRESSIVE SEQUENCE.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y286
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 436
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y287
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 113
Geologic Description:
Reported Environment: MARINE AND PARALIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y288
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y289
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 915
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GR (GERMAN CK FM, PEAWADDY FM), GEBBIE SUB-GR (CATHERINE SST, ALDEBARAN SST), TIVERTON SUB-GR (CATTLE CK)

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y218
Basal Information: Depth to Base:TD Base Elevation: -893 ± Thickness: >156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:94 Base Elevation: 90 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:94 Base Elevation: 90 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:149 Base Elevation: 35 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:390 Base Elevation: -296 Thickness: 241
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
GERMAN CK SM CORREL. 290 -186
U.SHELL FOSS HORIZON 363 -179
Tectonic Structure:
Remarks GERMAN CK SM CORRELATIVE IS A MDST

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:390 Base Elevation: -206 Thickness: 241
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS.

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:494 Base Elevation: -310 Thickness: 104
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 415
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 824
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GP(MACMILLAN, GERMAN CK FMS), GEBBIE SUB-GP(INGELARA FM, ALDEBARAN SST), TIVERTON SUB-GP(CATTLE CK FM)

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:TD Base Elevation: -890 + Thickness: >156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK CM Age: PERMIAN Interpretation Code:Y401
Basal Information: Depth to Base:119 Base Elevation: +65 Thickness: 116
Geologic Description: LT COLOURED MICAC SST WITH COAL SMS. SST IS F GRAINED, M SORT, 35-70% QZ, 5-18% FELD, 5-18% MUSC, 5-25% CLAY, 5-30% CALC AND SID CEMENT.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y402
Basal Information: Depth to Base:366 Base Elevation: -182 Thickness: 245
Geologic Description: DK GY MICAC SLTST AND MDST WITH NUM CARB LAM. SST INTBDS IN UPPER PART ARE F-M GRAINED, WELL SORT, CALC, CARB. GRAINS OF QZ, FELD, MUSC, VOLC.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y403
Basal Information: Depth to Base:366 Base Elevation: -182 Thickness: 361
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GERMAN CREEK FM AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y404
Basal Information: Depth to Base:393 Base Elevation: -209 Thickness: 271
Geologic Description: LT GY SST WITH MINOR INTERCALATIONS OF BN-GY SLTST AND MDST. SST IS ORTHOQZITE AT TOP AND ARG AND FELD AT BOTTOM. TOURM, ZIRC, PY IN PLACES.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y405
Basal Information: Depth to Base:499 Base Elevation: -315 Thickness: 106
Geologic Description: DK GY-BLK MDST AND SLTST WITH SOME AREN INTERCALATIONS. SST IS VF GRAINED, WELL SORT, 25-65% QZ, 5-10% FELD, 10-25% CLAY. 5-20% CALC CEMENT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
LIMESTONE, MARINE 497 -313 3
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y406
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 306
Geologic Description: SST WITH MINOR SLTST AND MDST INTBDS. SST IS M GRAINED, WELL SORT, 65-80% QZ(WITH OVERGROWTHS), 5-15% FELD, 10% KAOLINITE, MINOR ROCK FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y407
Basal Information: Depth to Base:805 Base Elevation: -621 Thickness: 6..
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM, ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y408
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 112
Geologic Description: SST AND SLTST WITH SOME MDST INTBDS. SST IS F-M GRAINED, WELL SORT, 30-40% QZ, 0-20% FELD, 5-20% CLAY, 20-50% CALC AND SID CEMENT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS STAIRCASE SST MB.

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y409
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y410
Basal Information: Depth to Base:917 Base Elevation: -733 Thickness: 1156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GP(GERMAN CK, PEAWADDY FM), GEBBIE SUB-GP(CATHERINE SST, INGELARA FM, ALDEBARAN SST), TIVERTON (CATTLE CK)

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y411
Basal Information: Depth to Base:TD Base Elevation: -890 ± Thickness:)156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DENISON NS 53

REFERENCE # 898

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE	SF/55-15	23 37'27"S	148 24'34"E	175	175	-77	252	

REFERENCE: Y1 WALLIN, C.I., AND TUTTLE, J.S.
DEPARTMENTAL DRILLING IN THE ENSHAM AND EMERALD SOUTH AREAS, SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1982/13 Page FIG 15;T 2 Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -77 # Thickness:)32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -77 # Thickness:)95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:4 Base Elevation: 171 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:156 Base Elevation: 19 Thickness: 151
Geologic Description: MDST, SILTY MDST, VF-F ARENITE. LT GN TO GN-GY, MUDCRACKS, EUESTHERIA FOSSILS, CALC, SLICKS, CONE IN CONE, FRACTURED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:219 Base Elevation: -44 Thickness: 63
Geologic Description: SLTST, MDST, VF-M ARENITE, COAL. LT-DK GY, PARALLEL & XBDD, BIOTURB, CARB, GLOSSOPTERIS, CARB, CALC, SID, TFAC AT BOTTOM.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ARIES I SM	156.66	18.34	0.41
COAL, ARIES II SM	164.48	10.52	1.76
COAL, CASTOR SM	172.78	2.22	0.52
COAL, POLLUX SM	191.97	-16.97	1.31

Tectonic Structure: SLICKS, HIGH ANGLE FRACTURES

Remarks TABLE 2 RECORDS ORION SM A 199.14 MD DEPTH TO BASE(8.21M YK) BUT DOES NOT APPEAR ON LOG.

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y184
Basal Information: Depth to Base:TD Base Elevation: -77# Thickness:)32
Geologic Description: SLTST, MDST, F-M AREHITE, SILTY AREN, COAL. LT-DK GY, V TFAC, CARB, BIOTURB, WORM BURROWS, PLANT FOSSILS, IRREG BDD-LAMD
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	224	-49	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:TD Base Elevation: -77# Thickness:)95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL CM AND BURNGROVE FM

CONTROL POINT: DENISON NS 70

REFERENCE # 881

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-15	23 30'49"S	148 13'04"E	172	172	52	114	

REFERENCE: X1

THIS REPORT

Page : Publn Year:

Cross Reference: WALLIN, C.I., 1982, AN EVALUATION OF THE SHALLOW COAL RESOURCES IN THE ENSHAM AR EA, SOUTH CENTRAL BOWEN BASIN: GEOL. SURV. QLD. RECORD 1982/6

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +58 # Thickness: >52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +58 # Thickness: >52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:62 Base Elevation: 110 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: 58# Thickness: >52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ARIES I SM	63	109	0.6
COAL, ARIES II SM	69.2	102.8	9.6
COAL, CASTOR SM	91.4	88.6	4.6
COAL, POLLUX SM	101.7	70.3	2.5

Tectonic Structure:
Remarks TOP OF RANGAL ASSUMED TO BE AT HIGHEST COAL SM(ARIES I). THE BOUNDARY IS USUALLY A FEW METRES HIGHER THAN THIS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: 58# Thickness: >52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL CM.

CONTROL POINT: EM 4 LEURA CREEK

REFERENCE # B74

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-16	23 08'45"S	149 42'20"E	+325	+325	-294	619	

REFERENCE: MALONE, E.J., OLGERS, F., AND KIRKEGAARD, A.G.
THE GEOLOGY OF THE DUARINGA AND SAINT LAWRENCE 1:250,000 SHEET AREAS, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, REPORT 121 Page 28, FIG 5 Publn Year: 1969

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: BOOMER FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:408 Base Elevation: -83 Thickness: 408
Geologic Description: INTEDD BL-GY VOLCANOLITHIC SST AND SLTST. SST SOMETIMES GRADE TO SLTST AND SHARP CONTRACT FOLLOWS WITH OVERLYING SST.
Reported Environment: PARTLY TO WHOLLY MARINE. CLASTIC PROVENANCE TO THE EAST. POSSIBLY DEPOSITED AT EASTERN MARGIN OF A NARROW MARINE STRAIT OPEN TO THE NTH AND STH.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 5-25 DG EAST FROM CONNORS VOLC DOME
Remarks DEPTH AND ELEVATION OF BASE EXTRAPOLATED BY CALCULATING APPARENT THICKNESS FOR 15 DG DIP

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:408 Base Elevation: -83 Thickness: 408
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BOOMER FM

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -294 Thickness: 198
Geologic Description: DK BLUE SLTST AND LST WITH CALC TO FELDSPATHIC FOSSILIFEROUS SST. TUFFACEOUS IN PART. PRIMARY VOLCANICS AT BASE (FLOWS AND TUFF)
Reported Environment: MARINE TO PARALIC
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE, NO FOSS	426	-101	13 CA
VOLCANICS	596	-271	>25
LIMESTONE	608	-283	1 CA
TUFF	619	-294	4 CA

Tectonic Structure: DIPS 10-35 DG E FROM CONNORS VOLC DOME
Remarks UNCONFM ON CONNORS VOLC. PROBABLY TIVERTON EUQIVALENT. DEPTH AND ELEVATION CALCULATED FROM APPARENT THICKNESS FOR 20 DG

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -294 Thickness: 606
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: EM 8 LEURA HILL

REFERENCE # B73

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-16	23 10'05"S	149 34'05"E	+95	+95	-17	112	

REFERENCE: MALONE, E.J., OLGERS, F., AND KIRKEGAARD, A.G.
THE GEOLOGY OF THE DUARINGA AND SAINT LAWRENCE 1:250,000 SHEET AREAS, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, REPORT 121 Page FIG 6 Publn Year: 1969

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: BOOMER FM Age: PERMIAN Interpretation Code:Y181
Basal Information: Depth to Base:TD Base Elevation: -17 * Thickness: >112
Geologic Description: INTBDD GY-BUFF SH-CLAST SLTST, CLST, AND HARD QZ-LITHIC XBDD BUFF SST. WORM TRACKS ON BEDDING PLANES AT BASE OF SECTION
Reported Environment: PARTLY TO WHOLLY MARINE. CLASTIC PROVENANCE TO THE EAST. POSSIBLY DEPOSITED AT EASTERN MARGIN OF A NARROW MARINE STRAIT OPEN TO THE NTH AND STH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 14-23 DG W. ON W FLANK CONNORS DOME
Remarks DEPTH AND ELEVATION EXTRAPOLATED BY CALCULATING APPARENT THICKNESS FOR 19 DG DIP

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y182
Basal Information: Depth to Base:TD Base Elevation: -17 * Thickness: >112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BOOMER FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y183
Basal Information: Depth to Base:TD Base Elevation: -17 * Thickness: >112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BOOMER FM, OF BLENHEIM SUB-GP

CONTROL POINT: EMERALD NS 1

REFERENCE # B71

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-15	23 14'00"S	148 26'25"E	+238	+239	-127	366	

REFERENCE: PARK, W.J.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN EMERALD AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/28 Page Publn Year: 1973

Cross Reference: PROUZA V 1977, GEOL. SURV. QLD. RECORD 1977/27, TABLE 2

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:252 Base Elevation: -13 Thickness: 145
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:252 Base Elevation: -13 Thickness:)177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -127 * Thickness:)79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:107 Base Elevation: +132 Thickness:)32
Geologic Description: DARK GREY TO BLACK SILTY MDST AND MDST WITH TUFF, MDST, SLTST, AND F SST; ABUNDANT WORM BURROWS
Reported Environment: OPEN SHELF
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOWER SECTION OF BURNGROVE FM EQUATED WITH BLACK ALLEY SH. TOTAL THICKNESS NOT KNOWN: TOP OF BORE OPEN, TERTIARY AT SURF

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:252 Base Elevation: -13 Thickness: 145
Geologic Description: LT GY TO WH, F-M GRAINED SST WITH IRREG LAM OF CARB FRAG AND NUM THIN PBLY BNDS. CARB AND TFAC MDST AND COAL SMS; WORM BURROWS
Reported Environment: SUB-AERIAL DELTAIC WITH PROLONGED PERIODS OF PEAT SWAMP DEVELOPMENT
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HERCULES SM	131	+108	7
COAL, CANIS SM	177	+62	14
COAL, LEPUS SM	202	+37	9
COAL, FAIR HILL SM	221	+18	2

Tectonic Structure:

Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:252 Base Elevation: -13 Thickness:)177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BURNGROVE AND FAIR HILL FMS.

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:287 Base Elevation: -48 Thickness: 35
Geologic Description: UPPER PART: INTBDD SST, SLTST, MDST; LOWER PART: DK GY SILTY MDST. CRINOID AND SHELL FRAGMENTS AT BASE, WORM BURROWS COMMON.
Reported Environment: LOWER PART NERITIC; UPPER PART TRANSITIONAL (LITTORAL-BRACKISH) (PROUZA,1977)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -127 * Thickness:)79
Geologic Description: SUB-LABILE TO QZOSE, F-M GRAINED SST WITH MINOR SLTST AND MDST AND COAL; WORM BURROWS; SCATTERED MARINE SHELL FOSSILS.
Reported Environment: PARTLY PARALIC. (DELTAIC, FLUVIAL, PALUDAL, PROUZA, 1977)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, PLEIDES SM	290	-51	1
COAL, AQUILA SM	311	-72	<1
COAL, TIER1 SM	351	-112	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -127 * Thickness:)114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -127 * Thickness:)114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN AND GERMAN CREEK FMS OF BLENHEIM SUB-GROUP

CONTROL POINT: EMERALD NS 2

REFERENCE # B78

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SF/55-15	23 21'55"S	148 26'27"E	+185	+186	-367	553	

REFERENCE: PARK, W.J.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN EMERALD AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/28 Page Publn Year: 1973

Cross Reference: ANDERSON JC 1971, QLD GOVT MINING JOURNAL, 72, 393-396 / PROUZA AND PARK 1973, Q
LD GOVT MINING JOURNAL, 74, 433-438 / PROUZA V 1977, GSQ RECORD 1977/27,TBL 2

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:108 Base Elevation: +78 Thickness:)107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:475 Base Elevation: -289 Thickness: 146
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:475 Base Elevation: -289 Thickness: 367
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION.

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:TD Base Elevation: -367 Thickness:)36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

~~STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X~~
~~Basal Information: Depth to Base:TD Base Elevation: +43 Thickness:)43~~
~~Geologic Description:~~
~~Reported Environment:~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING~~

~~STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X~~

~~Basal Information: Depth to Base: 0 Base Elevation: +43 ± Thickness: 174~~
~~Geologic Description:~~
~~Reported Environment:~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING~~

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code: Y101
Basal Information: Depth to Base: 108 Base Elevation: +78 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base: 158 Base Elevation: +28 Thickness: 50
Geologic Description: INTBDD LIGHT GREY SST, GREY SLTST, DARK GREY MDST AND COAL SMS; CARB LEAF REMAINS; A FEW WORM BURROWS
Reported Environment: SUB-AERIAL DELTAIC WITH MINOR MARINE INFLUENCE. CONTINENTAL AT TOP OF FM
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ARIES SM	121	+65	1.5
COAL, CASTOR SM	128	+58	1
COAL, POLLUX SM	136	+50	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: 329 Base Elevation: -143 Thickness: 171
Geologic Description: LIGHT GREEN SST, GREENISH-GREY STLST AND MDST, AND COAL SMS WITH THIN TFAC INTBDS; PLANT FOSSILS; SOME WORM BURROWS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code: Y104
Basal Information: Depth to Base: 475 Base Elevation: -289 Thickness: 146
Geologic Description: LIGHT GREY TO WHITE, F-M GRAINED FELDSPATHO-LITHIC SST WITH CARB FRAGMENTS AND PEBBLY BANDS; SEAMS OF INTBDD CARB MDST, TFAC MDST, AND COAL.
Reported Environment: PALUDAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HERCULES SM	378	-192	6
COAL, CANUS SM	417	-231	3
COAL, LEPUS SM	438	-252	7
COAL, FAIR HILL SM	455	-269	4

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code: Y105
Basal Information: Depth to Base: 475 Base Elevation: -289 Thickness: 367
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL CM, BURNGROVE FM, AND FAIR HILL FM.

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:517 Base Elevation: -331 Thickness: 42
Geologic Description: DK GREY SILTY MDST AT BASE; INTBDD SST, SLTST, AND MDST IN UPPER PART. WORM BURROWS COMMON; CRINOID STEMS AND PLATES; SHELL REMAINS AT BASE
Reported Environment: NERITIC TO TRANSITIONAL (PARTLY LITTORAL, PARTLY BRACKISH - PROUZA 1977)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -367 * Thickness: >36
Geologic Description: SST, MINOR SLTST AND MDST, RARE THIN COAL SMS; FEW FOSSIL PLANT REMAINS, ORG BURROWS, RARE MARINE FOSSILS (PROUZA, 1977)
Reported Environment: SHALLOW MARINE, GRADUAL REGRESSION DURING DEPOSITION (PARTLY FLUVIAL, PARTLY DELTAIC, MINOR MARINE (PROUZA, 1977))
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:TD Base Elevation: -367 * Thickness: >78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN FM AND CROCKER FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:TD Base Elevation: -367 * Thickness: >78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GP (MACMILLAN FM, CROCKER FM)

CONTROL POINT : EMERALD NS 20

REFERENCE # B89

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-15	23 35'47"S	148 26'35"E	179	180	43	137	

REFERENCE: PARK, W.J.
COAL EXPLORATION SOUTH CENTRAL BOWEN BASIN - EMERALD AREA STAGE II DRILLING
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/6 Page FIG. 5 Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:27 Base Elevation: 153 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:63 Base Elevation: 117 Thickness: 35↑
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 14-15 DG DIP
Remarks THICKNESS CORRECTED FOR 15 DG DIP

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:122 Base Elevation: 58 Thickness: 59
Geologic Description: INTBDD-LAMD FINE SST, SLTST, MDST, COAL. PLANT FOSSILS, TUFFACEOUS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ARIES SM	65	115	2
COAL, CASTOR SM	74	106	1
COAL, POLLUX SM ?	101	79	<1
TUFF T'OUT			

Tectonic Structure: DIPS 1-19 DG
Remarks NO THICKNESS CORRECTION

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: 43↓ Thickness: >15
Geologic Description: FINE SST WITH INTBDD MDST, SLTST, COAL AND TUFF. ORGANIC DISRUPTION, PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, VIRGO SM	125	55	3
TUFFS T'OUT			

Tectonic Structure: DIPS 3 DG
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: 43↓ Thickness: >74
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
Tectonic Structure:				
Remarks	RANGAL CM AND BURNGROVE FM			

CONTROL POINT: EMERALD NS 21

REFERENCE # B78

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE	SF/55-15	23 15'10"S	148 16'07"E	186	187	4	183	

REFERENCE: PARK, W.J.
COAL EXPLORATION SOUTH CENTRAL BOWEN BASIN - EMERALD AREA STAGE II DRILLING
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/6 Page FIG 8 Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +4 * Thickness: >114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Yi0i
Basal Information: Depth to Base:69 Base Elevation: 118 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE IS UNCERTAIN

STRATIGRAPHY: GERMAN CREEK CM Age: PERMIAN Interpretation Code:Yi02
Basal Information: Depth to Base:TD Base Elevation: 4* Thickness: >114
Geologic Description: FINE-MED SST, SLTST, MDST; PEBBLY HORIZONS. BIOTURBATION, PLANT FOSSILS AT BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
TUFF 123 64 <1
Tectonic Structure: DIPS 0-8 DG
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Yi03
Basal Information: Depth to Base:TD Base Elevation: 4* Thickness: >144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GERMAN CREEK CM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Yi04
Basal Information: Depth to Base:TD Base Elevation: 4* Thickness: >144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GERMAN CREEK CM

CONTROL POINT: EMERALD NS 57

REFERENCE # B94

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-16	23 49'49"S	148 30'34"E	+155	+156	-172	328	

REFERENCE: ZILLMAN, N.J.
GEOLOGY AND COAL RESOURCES OF THE TOGARA AREA SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/14 Page Publn Year: 1978

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:208 Base Elevation: -52 * Thickness: >136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -172 * Thickness: >44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -172 * Thickness: >120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:72 Base Elevation: +84 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:208 Base Elevation: -52 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:284 Base Elevation: -128 Thickness: 76

Geologic Description: LT GREY SUB-LAB ARENITE, GREY TO DK GREY SLTST WITH MDST AND SEVERAL COAL SEAMS
Reported Environment: DELTAIC
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ARIES SM	213	-57	(1
COAL, POLLUX SM	245	-98	(1

Tectonic Structure:
Remarks

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y184
Basal Information: Depth to Base:TD Base Elevation: -172 # Thickness:)44
Geologic Description: SLTST AND MDST WITH MINOR ARENITE AND COAL SMS CONTAINING MDST AND TFAC INTBDS. SOME SLUMPING; CALC PATCHES, MDST CLASTS, PLANT DEBRIS.
Reported Environment: DELTAIC. NEASHORE MARSHES AND SWAMPS.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, VIRGO SM (?)	285	-129	1
COAL, LEO SM (?)	322	-166	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:TD Base Elevation: -172 # Thickness:)120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL CM AND BURNGROVE FM.

CONTROL POINT: LEURA NS 31R

REFERENCE # 276

	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
	GEOL. SURV. QLD.	DDH, CORE, WIRELINE	SF/55-16	23 18'11"S	148 52'82"E	+126	+127	-27	154	

REFERENCE: STAINES, H.R.E.
COAL EXPLORATION, SOUTH CENTRAL BOWEN BASIN JELLINBAH-CALEDONIA AREA BASIC EXPLORATION DATA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/44 Page FIG B 14 Publn Year: 1978

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -27 * Thickness: >126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -27 * Thickness: >126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -27 * Thickness: >126
Geologic Description: SANDSTONE WITH SHALE BEDS AND DARK SHALE AND MUDSTONE ENCLOSING COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, PISCES SM	144	-17	7

Tectonic Structure:
Remarks OPENHOLE TO 90 M, DRILLERS DESCRIPTION ABOVE 135 M, AND UNLOGGED CORE BELOW 146 M.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -27 * Thickness: >126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL CM

CONTROL POINT: SHOTOVER 1

REFERENCE # B18BY1
REFERENCE # B18BX1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HOUSTON OIL&MIN.	RCH, CORE + WIRELINE	SF/55-16	23 57'36"S	149 08'16"E	456	460	-2256	2716	?

REFERENCE: X1 THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1 HOUSTON OIL AND MINERALS
HOM SHOTOVER 1 WELL COMPLETION REPORT
UNPUBLSIHED COMPANY REPORT
Page Publn Year: 1975

Cross Reference: BENBOW, DENIS, 1975, HOM SHOTOVER 1 LITHOLOGY REPORT (UNPUBLISHED COMPNAY REPORT)

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:954 Base Elevation: -494 Thickness: 958
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:1387 Base Elevation: -927 Thickness: 433
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1436 Base Elevation: -976 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1534 Base Elevation: -1074 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: MAJOR THRUST AT 1436 M, HENCE REPETITION
Remarks MAJOR THRUST FAULT AT "ABOUT 1450 M" (BEESTON, 1983) & BLACKWATER GP AT THIS DEPTH IN FAULT BRECCIA ZONE.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1820 Base Elevation: -1360 Thickness: 280
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: MAJOR THRUST AT 1920 M, HENCE REPETITION
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:2085 Base Elevation: -1625 Thickness: 265
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X170
Basal Information: Depth to Base:TD Base Elevation: -2256# Thickness: >631
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y181
Basal Information: Depth to Base:954 Base Elevation: -494 Thickness: 950
Geologic Description: GREY-GREEN SHALES AND SILTSTONE WITH INTERMITTENT FINE GRAINED SANDSTONE AND OCCASIONAL RED-BROWN SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1387 Base Elevation: -927 Thickness: 433
Geologic Description: INTBDD GY LITHIC CALC SS, GY SLTST, GY-BLK SH, COAL. UPPER PART (RANGAL)CONTAINS BRIGHT BLOCKY COAL AND MINOR INTBDD GN MDST, SLTST, DIRTY SS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL (TOP)	975	-515	3 CA
COAL (TOP)	991	-531	3 CA
COAL (TOP)	1021	-560	3 CA
COAL (TOP)	1079	-619	3 CA

Tectonic Structure:
Remarks: UPPER PART RANGAL CM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1436 Base Elevation: -976 Thickness: 49
Geologic Description: GREY-DARK GREY SH, MINOR SLTST. OCCASIONAL VOLCANIC INCLUSIONS AND MINOR TUFF BEDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1534 Base Elevation: -1074 Thickness: 94
Geologic Description: INTBDD GREY LITHIC SS AND SLTST, GREY TO BLACK CARB SH, AND COAL. COAL IS DULL TO BRIGHT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

	COAL (TOP)	1436	-976	9 CA
	COAL (TOP)	1448	-988	6 CA
	COAL (TOP)	1457	-997	6 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1820 Base Elevation: -1360 Thickness: 280
Geologic Description: INTBDD F-M GRAINED, LITHIC, CALC SS; GREY SLTST; GREY-BLACK CARB SH; OCCASIONAL LST INTBDS; MINOR VOLC INCLUSIONS; JAROSITE, PY, GYPSUM, CHALCPY
Reported Environment: UPPER PART MAY BE PARTLY MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: WELL SECTION DOES NOT CORRESPOND TO TYPE SECTION BUT MAY BE TIME EQUIVALENT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1820 Base Elevation: -1360 Thickness: 423
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BLACK ALLEY SH, GERMAN CREEK FM, PEAWADDY FM

STRATIGRAPHY: COLLINSVILLE CM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2085 Base Elevation: -1625 Thickness: 265
Geologic Description: GREY SLTST AND SH, CARB SH, AND COAL; MINOR GY-BR LITHIC SS, LST, TUFF (LOWER PART) INTBDD. SECTION VERY CALC. COAL IS DULL AND DIRTY
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL (TOP)	1820	-1360	3 CA
COAL (TOP)	1832	-1372	3 CA
COAL (TOP)	1865	-1405	3 CA
COAL (TOP)	1884	-1424	6 CA

Tectonic Structure:
Remarks: COALS ALSO AT 1923 M, 1935 M, 1966 M DEPTHS (TOPS)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2085 Base Elevation: -1625 Thickness: 265
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS COLLINSVILLE CM.

STRATIGRAPHY: CATTLE CK FM EQUIV Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:2627 Base Elevation: -2167 Thickness: 543
Geologic Description: INTBDD GY-BR LITHIC SS, SLTST, SH WITH MINOR LST AND COAL INTBDS. UPPER PART FINER GRAINED AND COAL-BEARING; THICK CLEAN MEDIUM SS LOWER PART.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, VERY DULL	2100	-1640	13 CA

Tectonic Structure:
Remarks: COAL IN UPPER PART IS SMUTTY AND PARTLY COKED (VESICLES). SEAMS ARE THI N AND GRADATIONAL WITH CARB SHALES

STRATIGRAPHY: BUFFEL FM EQUIV Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -2256? Thickness:)89
Geologic Description: INTBDD GY-BR V CALC LITHIC SS AND SLTST, GY SH AND LMT. MINOR CREAM-GY TF INTBDS. LST IS GY-BR, AREN-SILTY CONTAINS SHELLY FRAGMENTS.
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -2256# Thickness:)632
Geologic Description.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS C..TLE CREEK EQUIVALENT AND BUFFEL FM.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -2256# Thickness:)1320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE, AND TIVERTON SUB-GROUPS.

CONTROL POINT: TALBOT NS 239

REFERENCE # 888

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE	SF/55-15	23 27'29"S	148 29'16"E	168	168	5	163	

REFERENCE: Y1 WALLIN, C.I., AND TUTTLE, J.S.
DEPARTMENTAL DRILLING IN THE ENSHAM AND EMERALD SOUTH AREAS, SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1982/13 Page FIG 20;T 2 Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -5 Thickness: >43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +5 * Thickness: >104
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:58 Base Elevation: 110 Thickness: 58
Geologic Description: MDST AND F ARENITE, LT GN-GY, SILTY, INTLAMD-BDD, MINOR XBDG, MUDCRACKS, SID, EUESTHERIA FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:119 Base Elevation: 49 Thickness: 61
Geologic Description: SLTST, MDST, F-VF ARENITE, CCAL. LT GY-GY, IRREG INTLAMD-BDD, RIPPLES, LOAD CASTS, MNR XBDS, SID, PLANT FOSS, TFAC BASE, CARB, CALC IN PART
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, ARIES I SM	58.95	109.05	0.78
COAL, ARIES-CASTOR	78.45	89.55	5.87
COAL, POLLUX SM	89.37	78.63	1.34
COAL, ORION SM	93.13	74.87	0.21

Tectonic Structure:
Remarks GLOSSOPTERIS AND SPHENOPTERIS PLANT REMAINS

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: 5? Thickness: >43
Geologic Description: MDST, VF-C ARENITE, SLTST, COAL, TUFF. LT-DK GY & GN, WORM BURROWS?, MINOR BIOTURB, CARB, MICAC, SID.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF AND MDST	125	43	5

	COAL	136	32	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: 5# Thickness:)104
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS BURNGROVE FM AND RANGAL CM

CONTROL POINT: TALBOT NS 48

REFERENCE # B66

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-16	23 00'46"S	148 36'30"E	+159	+159	-147	306	

REFERENCE: ZILLMAN, N.J.
COAL RESOURCES SOUTH CENTRAL BOWEN BASIN, OAKY CREEK AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/27 VOLUME A AND B Page Publn Year:

Cross Reference: BEESTON, J.W., 1977,PETROGRAPHIC ASSESSMENT OF THE GERMAN CREEK SEAM, CENTRAL QUEENSLAND, QGMJ VOL 78 P181-191.

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:73 Base Elevation: +86 Thickness: >73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -147 * Thickness: >162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:73 Base Elevation: +86 Thickness: 73
Geologic Description: LT BROWN SST AND LT GREY TO GREY SLTST AND MDST. SEQUENCE IS AREN IN THE TOP AND ARG WITH COAL IN BOTTOM
Reported Environment: NON-MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 60 +99 CA
Tectonic Structure:
Remarks THICKNESS APPROXIMATE.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:73 Base Elevation: +86 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FAIR HILL FM. THICKNESS APPROXIMATE.

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:144 Base Elevation: +15 Thickness: 71
Geologic Description: LT GY TO GY LITHIC SST WITH CLASTS OR THIN BDS OF MDST, AND MDST AND SLTST WITH FINE SST BDS. IRREGULAL BDG COMMON. PLANT FOSSILS (114 M DEPTH)
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS APPROXIMATE.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -147 * Thickness: >162
Geologic Description: LT-DK GREY SUB-LABILE SST WITH COAL AND NUM SLTST, MDST, OR CARB LAM AND THIN BDS. SST IS F-M GRAINED, POOR-MEDIUM SORT, XBDD, BIOTURB. PLT FOSS
Reported Environment: REGRESSIVE TERRESTRIAL DEPOSITION WITH MINOR MARINE INCURSIONS. UPPER COAL BEARING PART GENERALLY DESCRIBED AS COAL CYCLOTHEMS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, PLEIDES SM	166	-7	2
COAL, AQUILA SM	191	-32	2.27
COAL, TIERI SM	226	-67	3.5
COAL, GERMAN CK SM	300	-141	2.44

Tectonic Structure: DIP OF 5 DG IN BORE
Remarks: CORVUS SM AT 261 M DEPTH (-102 MSL) IS 0.75 M THICK

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -147 * Thickness: >233
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MACMILLAN AND GERMAN CREEK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -147 * Thickness: >233
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MACMILLAN AND GERMAN CREEK FMS OF BLENHEIM SUB-GP.

CONTROL POINT: TALBOT NS 6

REFERENCE # B68

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-16	23 07'50"S	148 30'49"E	+205	+206	-65	271	

REFERENCE: ZILLMAN, N.J.
COAL RESOURCES SOUTH CENTRAL BOWEN BASIN, OAKY CREEK AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/27 Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, CENTRAL

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:56 Base Elevation: +150 Thickness:)192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 138 M. VALUES USED IN CONTOUR MAPPING.

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:56 Base Elevation: +150 Thickness:)55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 138 M. VALUES USED IN CONTOUR MAPPING.

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -65 * Thickness:)159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:56 Base Elevation: +150 Thickness: 55
Geologic Description: GREY MUDSTONE WITH ARENITE AND SILTSTONE AND SOME COAL
Reported Environment: NON-MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 42 +164 2
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:56 Base Elevation: +150 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:114 Base Elevation: +92 Thickness: 58
Geologic Description: DARK GREY MUDSTONE WITH GREY ARENITE; MICACEOUS IN PARTS; BIOTURBATED; CRINOIDS AND FOSSIL SHELLS
Reported Environment: MARINE, PARALIC TO NERITIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -65 ± Thickness: >159
Geologic Description: LT GREY ARENITE WITH MINOR MUDSTONE (MICACEOUS IN PARTS),COAL SEAMS; MASSIVE OR THINLY BDD-LAMINATED; PYRITIC BANDS; BIOTURBATED; PLANT FOSSILS
Reported Environment: LOWER PART MOSTLY TERRESTRIAL WITH MINOR MARINE INFLUENCE. UPPER PART TERRESTRIAL AND MARSHY
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL	122	+64	3
	COAL	142	+64	2
	COAL	211	-5	1
	COAL	240	-3	<1

Tectonic Structure: DIPS 2-3 DG
Remarks OTHER THIN (<1 M) COALS AT 163 M (+43 MSL) AND 183 M (+23 MSL)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -65 ± Thickness: >217
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN FM AND GERMAN CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -65 ± Thickness: >217
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN FM AND GERMAN CREEK FM OF BLENHEIM SUB-GROUP

BOWEN

BASIN

SE

CONTROL POINT: BANANA NS 1-B

REFERENCE # B144Y1
REFERENCE # B144Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-1	24 42'45"S	150 04'10"E	CA 160	CA 160	-1726	CA1886	?C

REFERENCE: Y1 DEAR, J.F., MCKELLAR, R.G., AND TUCKER, R.M.
GEOLOGY OF THE MONTO 1:250,000 SHEET AREA
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 46 Page Publn Year: 1971
Cross Reference:

REFERENCE: Y2 GRAY, A.R.G., AND HEYWOOD, P.B.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79 Page 651-664 Publn Year: 1978
Cross Reference: COLTON H.C. 1971, IN DAVIS A (ED) GEOL. SURV. QLD. REPORT 62, 133-138

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:23 Base Elevation: +137 Thickness: >170
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. GREATER THICKNESS OF UNIT GIVEN BY DEAR ET AL VSG & H MAY BY SURFACE SECTION ABOVE BORE TOP?

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:170 Base Elevation: -10 Thickness: 170
Geologic Description: M-C SST, SLTST, MDST AND COAL; KALOOLA MB F SST, SLTST, LAVA (FIG.9)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
KALOOLA MB	170	-10	CA 70
COAL	30	+130	3
COAL	47	+113	2
COAL INTERVAL	88	+72	16

Tectonic Structure:
Remarks

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:605 Base Elevation: -445 Thickness: 435
Geologic Description: M-C SST, CGL, MDST/SH, F SST (FIG.9)
Reported Environment: NON-MARINE (P.60)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:605 Base Elevation: -445 Thickness: 605
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM AND GYRANDA FM

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y104

Basal Information: Depth to Base:800 Base Elevation: -640 Thickness: 195
Geologic Description: M-C AND F SST, SLTST AND MDST/SH (FIG.9)
Reported Environment: MARINE (P.58)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1005 Base Elevation: -845 Thickness: 205
Geologic Description: SLTST AND MUDST/SH (FIG.9)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1065 Base Elevation: -905 Thickness: 60
Geologic Description: SLTST, F LI SST AND MDST (FIG.9, P.53)
Reported Environment: MARINE (P.54)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1065 Base Elevation: -905 Thickness: 460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD, AND OXTRACK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1065 Base Elevation: -905 Thickness: 460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD AND OXTRACK FMS OF BLENHEIM SUB-GROUP

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1726? Thickness: 325
Geologic Description: F SST AND LAVA
Reported Environment: TERRESTRIAL (P.43)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IN THIS INTERPRETATION TOTAL DEPTH (TD) = 1090 M

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:23 Base Elevation: +137 Thickness: 23
Geologic Description: SST, SLTST, MDST, COAL SEAMS; KALOOLA MB TFAC SLTST, SST AND SH (COLTON 1971, P.135)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: WISEMAN FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:507 Base Elevation: -347 Thickness: 484
Geologic Description: COARSE CONGLOMERATIC SST, MDST AND SST AND CGL; FOSSIL WOOD (COLTON 1971, P.134)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANANA FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:971 Base Elevation: -81 Thickness: 464
Geologic Description: MDST CONTAINING BENTONITIC TUFF T'OLT, INTERMEDIATE TO ACID TUFF, SOME SST WEDGES WITH COAL; MARINE FOSS NEAR BASE; PLT FOSS (COLTON 1971 P.134)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:507 Base Elevation: -347 Thickness: 507
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1275 Base Elevation: -1115 Thickness: 304
Geologic Description: CALC FOSSILIFEROUS SST, CALC, SLMPD, SILTY MDST, AND SLTST-SST SEQ (COLTON 1971, P.134)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1731 Base Elevation: -1571 Thickness: 456
Geologic Description: MDST AND SILTY MDST (COLTON 1971, P.134)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1774 Base Elevation: -1614 Thickness: 43
Geologic Description: TFAC, CALC SLTST-SST SEQ, AND MDST SEQ, LESS TFAC, CALC SLTST-SST SEQ (COLTON 1971, P.134)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1774 Base Elevation: -1614 Thickness: 1267
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANANA, FLAT TOP, BARFIELD AND OXTRACK FMS

STRATIGRAPHY: BUFFEL FM EQUIV Age: PERMIAN Interpretation Code:Y289
Basal Information: Depth to Base:1871 Base Elevation: -1711 Thickness: 97
Geologic Description: RED AND GREEN TUFFS AND TFAC SST (COLTON 1971, P.134)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1871 Base Elevation: -1711 Thickness: 97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BUFFEL FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1871 Base Elevation: -1711 Thickness: 1364
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANANA, FLAT TOP, BARFIELD AND OXTRACK OF BLENHEIM SUB-GROUP, BUFFEL FM OF TIVERTON SUB-GROUP.

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -1726% Thickness:)15
Geologic Description: INTBDD INTERMEDIATE TO BASIC FLOWS, AGGLOMERATES AND TUFFS (COLTON 1971, P.133)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT TOP OF CAMBOON ANDESITE (COLTON 1971 P.133)

CONTROL POINT: BANANA NS 57

REFERENCE # B140

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED	SG/55-4	24 20'26"S	149 56'52"E		+97	-600	697	

REFERENCE: CHIU CHONG, E.S.
COAL RESOURCES - BARALABA-MOURA-KIANGA-THEODORE COALFIELD BANANA CREEK AREA
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 51 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:303 Base Elevation: -206 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -600 * Thickness: >394
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:327 Base Elevation: -230 Thickness: 308
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING AVG DIP OF 20 DEGS

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -600 * Thickness: >230
Geologic Description: WH LAE ARENITE, GY MDST, COAL SEAMS; KALOOLA MB - SUBLAB-LAB ARENITE (TFAC IN PARTS), MDST, THIN COAL BDS, GLOSSOPTERIS IN MDST; FAULT BRECCIA
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INT ?MOURA A+B	405	-308	58
?MOURA A+B REPEATED	493	-396	42
COAL ?MOURA C	585	-488	9
COAL INT ?MOURA D+E	639	-542	7

Tectonic Structure: DIPS RANGE FROM 10 TO 75 DEGS
Remarks ?THICKNESS CORRECTED FOR REPETITION DUE TO FAULTING AND AN AVG DIP OF 32 DEGS; FAULT BRECCIA AT -332 (39 M THICK)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -600 * Thickness: >230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS BARALABA CM

CONTROL POINT: BARALABA 17

REFERENCE # B139

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	AIR DRILLED	SG/55-4	24 05 29"S	149 57'36"E	+97 CA	+97 CA	-36	61	

REFERENCE: MALONE, E.J.
BOWEN BASIN SHALLOW DRILLING AND CORING PROGRAMME 1963
BUREAU OF MINERAL RESOURCES, AUSTRALIA RECORD 1963/153 Page 15 Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: SEDIMENTS Age: TERTIARY Interpretation Code:
Basal Information: Depth to Base:53 Base Elevation: +44 Thickness: 53
Geologic Description: RED SANDY SOIL, RED YELLOW AND BLUE-GREY CLAY. SOMETIMES PEBBLY TO GRAVELLY.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:
Basal Information: Depth to Base:TD Base Elevation: +36 * Thickness:)8
Geologic Description: HARD, DARK GREY-BLUE, FINE GRAINED ANDESITIC CRYSTAL TUFF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NAMED "LOWER BOWEN VOLCANICS" IN REFERENCE REPORT.

CONTROL POINT: D.R.D. 19

REFERENCE # B147

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-1	24 59'00"S	150 03'00"E	CA 180	CA 180	+48	132	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC DRILLING IN THE SURAT AND BOWEN BASINS, 1967-70
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 71 Page Publn Year: 1972
Cross Reference: DICKINS J.M. AND MALONE E.J. 1973, BMR BULLETIN 130

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:122 Base Elevation: +58 Thickness:)122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +48 # Thickness:) 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +48 # Thickness:)10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +48 Thickness:)10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:122 Base Elevation: +58 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +48 # Thickness:)10

Geologic Description: GN-GY, POORLY SORTED, LABILE, PARTLY CALC SST AND MINOR SLTST
Reported Environment: PALUDAL (DICKINS AND MALONE, 1973, P.127)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y183
Basal Information: Depth to Base:TD Base Elevation: +48 * Thickness:)19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM

CONTROL POINT: DAWSON VALLEY MINE

REFERENCE # B139

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
MT. MORGAN LTD.	GENERALISED SECTION	SG/55-4	24 10'25"S	149 48'45"E	CA +80	CA +80	-124	204	

REFERENCE: REID, J.H.
DAWSON COALFIELD, BARALABA
QUEENSLAND GOVERNMENT MINING JOURNAL, 45 Page 204-205 Publn Year: 1944

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -124 * Thickness: >189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -124 * Thickness: >189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALLUVIUM Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:15 Base Elevation: +65 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS APPROXIMATE

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -124 * Thickness: >189
Geologic Description: SST, SH, SHALY SST, GRITTY SST, COAL SEAMS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM NO.1	69	+11	1.8
COAL SEAM NO.2	96	-16	2.4
COAL SEAM NO.3	127	-47	2.7
COAL SEAM NO.4	148	-68	2.7

Tectonic Structure:
Remarks COAL SEAMS ALSO OCCUR AT +55 (3 M), -35 (2.7 M) AND -124 (1.8 M); UNDERLAIN BY ?GYRANDA FM AND BACK CREEK GP

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -124 * Thickness: >189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks	CONTAINS BARALABA CM

CONTROL POINT: MOURA 1

REFERENCE # B143Y1
REFERENCE # B143X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
TARGET EXPL.	RDH	SG/55-4	24 31'30"S	149 56'30"E	109	113	-2935	3048	?

REFERENCE: X1 THIS REPORT Page Publn Year:

Cross Reference:

REFERENCE: Y1 SELL, B.H.
T.E.P.L. MOURA NO.1 WELL COMPLETION REPORT
MINES ADMINISTRATION PTY LTD REPORT Q/1197/426 (UNPUBL) BMR FILE 69/2008 Page Publn Year: 1969

Cross Reference: GRAY A.R.G. AND HEYWOOD P.B. 1978, QMJ 79, 651-664

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:X101
Basal Information: Depth to Base:15 Base Elevation: +98 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:494 Base Elevation: -381 Thickness: 479
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: "PRODUCTIVE MB" Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:792 Base Elevation: -679 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BARALABA CM ABOVE THE KALOOLA TUFF MEMBER

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1024 Base Elevation: -911 Thickness: 530
Geologic Description: LT GY-BUFF M LI SL CARB SST, LT GY LI ARG SLTST, SILTY MDST, COAL; KALOOLA MB - BUFF-WH F-M LI TFAC SST, MINOR DK GY ARG SLTST
Reported Environment: LAKES AND SWAMPS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
1024 -911 116
Tectonic Structure:
Remarks INCLUDES "PRODUCTIVE MB"

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1779 Base Elevation: -1669 Thickness: 758
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1782 Base Elevation: -1669 Thickness: 1288
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2181 Base Elevation: -2068 Thickness: 402
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2935* Thickness: >867
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2935* Thickness: >1269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2935* Thickness: >1269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLUVIUM Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:15 Base Elevation: +98 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102

Basal Information: Depth to Base:494 Base Elevation: -381 Thickness: 479
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WISEMAN FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1390 Base Elevation: -1277 Thickness: 482
Geologic Description: M-DK GY LI ARG SLTST, LT GY-BUFF QZITE AND F-M LI ARG SST
Reported Environment: FRESH- AND/OR BRACKISH-WATER; LACUSTRINE (GRAY AND HEYWOOD 1978 P.659)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANANA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1779 Base Elevation: -1666 Thickness: 389
Geologic Description: DK GY-BLK CARB SH, GY ARG CARB SLTST, GY F-M LI ARG SLIGHTLY CALC SST
Reported Environment: BRACKISH WATER (GRAY AND HEYWOOD 1978 P.65)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1390 Base Elevation: -1277 Thickness: 896
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2181 Base Elevation: -2068 Thickness: 402
Geologic Description: LT GY ARG LI SL MICAC + CARB CALC SLTST GRADING TO SILTY ARG LST, DK GY CARB SH, MINOR M LI FLD ARG CALC SST
Reported Environment: NEARSHORE MARINE (GRAY AND HEYWOOD 1978 P.658)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -2935± Thickness:)867
Geologic Description: DK GY-BLK CARB SH, M-DK GY LITHIC ARG CARB CALC SLTST; SHELL FRAGMENTS IN SHALE
Reported Environment: SHALLOW-WATER MARINE (GREY AND HEYWOOD 1978 P.657)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -2935± Thickness:)1658
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS BANANA FM, FLAT TOP FM, AND BARFIELD FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -2935' Thickness: >1658
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: LOW DIPS THROUGHOUT
Remarks CONTAINS BANANA, FLAT TOP, AND BARFIELD FMS OF BLENHEIM SUB-GR.

CONTROL POINT: MOURA NS 6

REFERENCE # B142

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/56-1	24 30'15"S	150 03'08"E		143	-155	298	

REFERENCE: CHIU CHONG, E.S.
COAL RESOURCES-BARALABA-MOURA-KIANGA-THEODORE COALFIELD
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 35 Page Publn Year: 1969
Cross Reference: DICKINS J.M. AND MALONE E.J. 1973, BMR BULLETIN 130

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:87 Base Elevation: +58 Thickness:)87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -155* Thickness:)212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -155* Thickness:)212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:86 Base Elevation: +57 Thickness:)86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -155 * Thickness:)212
Geologic Description: WH LI FELDSPATHIC SST, COAL, MINOR GY MDST; KALOOLA MB - TFAC SST AND MDST AND THIN COAL BNDS WITH SILIC TFAC MDST; GLOSSOPTERIS-GANGAMOPTERIS
Reported Environment: PALUDAL (DICKINS AND MALONE 1973, P.127)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL WITH SH 'X'SEAM	90	+53	3
CKD COAL/TCH 'B'SEAM	179	-36	10
COAL 'C'+'D' SEAMS	247	-104	18
COAL 'E' SEAM	268	-125	CA 1

Tectonic Structure:

Remarks ALSO CONTAINS 'A' (AT +18) AND F (AT -162) SEAMS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: TD Base Elevation: -155 ± Thickness: >212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM

CONTROL POINT: MUNDUBBERA 5

REFERENCE # B148 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Dpt El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-5	25 15'00"S	150 10'00"E		168	-746	914	8Z

REFERENCE: GRAY, A.R.G., AND HEYWOOD, P.B.
STRATIGRAPHIC RELATIONSHIPS OF PERMAIN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79 Page 651-664 Publn Year: 1978
Cross Reference: MOLLAN R.G. ET AL. 1972, BMR REPORT NO.142

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:214 Base Elevation: -46 # Thickness:)214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:214 Base Elevation: -46 Thickness: 214
Geologic Description: VF-VC LAB-LI LAB SST, LT GN-GY SLTST, DK BR-GY CARB SH, MICAC ANDES OR DAC XL-LI TUFF, PY COAL, MDST AND MINOR CHERT AND CGL; INTBDD; LEAF FOSS
Reported Environment: FRESHWATER SWAMPS (MOLLAN ET AL. 1972 P.29)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	70	+98	50
COAL INTERVAL	200	-32	45
?KALOOLA MB	214	-46	135

Tectonic Structure:
Remarks PALYNOLOGY - PERMIAN UPPER STAGE 5

~~STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y101~~
~~Basal Information: Depth to Base:214 Base Elevation: 46 Thickness: 214~~
~~Geologic Description: VF-VC LAB-LI LAB SST, LT GN-GY SLTST, DK BR-GY CARB SH, MICAC ANDES OR DAC XL-LI TUFF, PY COAL, MDST AND MINOR CHERT AND CGL; INTBDD, LEAF FOSS~~
~~Reported Environment: FRESHWATER SWAMPS (MOLLAN ET AL. 1972 P.29)~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks PALYNOLOGY - PERMIAN UPPER STAGE 5~~

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:881 Base Elevation: -713 Thickness: 667
Geologic Description: DK GY-GY CARB MDST AND SH, LT GN AND GY SANDY, CHERTY SLTST, VF-C LAB-LI LAB SST, MINOR LST, TUFF AND CGL; LAMD, SLMPD, SED DYKES; PLT FOSS
Reported Environment: FRESH OR BRACKISH WATER; LACUSTRINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGY - PERMIAN UPPER STAGE 5

~~STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y102~~
~~Basal Information: Depth to Base:879 Base Elevation: 711 Thickness: 665~~
~~Geologic Description: DK GY-GY CARB MDST AND SH, LT GN AND GY SANDY CHERTY SLTST, VF-C LAB-LI LAB SST, MINOR LST, TUFF AND CGL; LAMD, SLMPD, SED DYKES; PLT FOSS~~
~~Reported Environment: FRESH OR BRACKISH WATER; LACUSTRINE FLUVIAL OR DELTAIC (MOLLAN ET AL. 1972 P.28)~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks PALYNOLOGY - PERMIAN UPPER STAGE 5~~

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:881 Base Elevation: -713 Thickness: 881
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

~~STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103~~
~~Basal Information: Depth to Base:879 Base Elevation: -711 Thickness: 879~~
~~Geologic Description:~~
~~Reported Environment:~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks CONTAINS BARALABA CM AND GYRANDA FM.~~

~~STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y104~~
~~Basal Information: Depth to Base:1306 Base Elevation: 1178 Thickness: 418~~
~~Geologic Description: CALC AND TFAC SLST, SOME BDG CHERTY, CARB MAT, LEAF FRAG, PY, MINOR INTBDD TUFF, CRINOID OSSICLES AND TABULATE CORAL, BDG LAMB AND BURROWED~~
~~Reported Environment: NEAR-SHORE MARINE~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks THICKNESS CORRECTED USING DIP TO 10 DEGS IN MUNDUBERA 6 AND 15 DEGS IN MUNDUBERA 7; PALYNOLOGY - PERMIAN UPPER STAGE 5~~

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -746 # Thickness: >35
Geologic Description:
Reported Environment: NEAR-SHORE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGY - PERMIAN UPPER STAGE 5

~~STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y105~~
~~Basal Information: Depth to Base:2100 Base Elevation: -1932 Thickness: 762~~
~~Geologic Description: SILTY CARB PY MDST, LI LAB (TFAC) SST, TUFF AND VOLC BREC, GN GY SLTST, LST, INTBDD, CARB FRAG AND PLT FOSS IN PARTS, MARINE FOSS~~
~~Reported Environment: SHALLOW WATER MARINE DEEP WATER MARINE, REDUCING ENVIRONMENT (HOLLAN ET AL. 1972 P.26)~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~PAGGION HILL FM 1340 -1172 33~~
~~ACACIA FM 1487 -1319 142~~
~~ORANGE CREEK FM 2100 -1932 587~~
~~Tectonic Structure:~~
~~Remarks INCLUDES PAGGION HILL, ACACIA, ORGANGE CK FMS. THICKNESS CORRECTED FOR 15 DG DIP IN MUND. 7 AND 20 DG DIP MUND.6~~

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -746 # Thickness: >35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP FM

~~STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:Y106~~
~~Basal Information: Depth to Base:2122 Base Elevation: -1954 Thickness: 21~~

~~Geologic Description: MUDDY LT GY LGT (TABULATE CORALS), GY CALC FY CLTST AND GY SILTY CALC FY MDST; $DC LAMINAR TO THICK; CORALS, CRINOID PLATES, BRYOZOANS, BRACHI~~
~~Reported Environment: SHALLOW MARINE WITH FLUCTUATING ENERGY~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks THICKNESS CORRECTED USING APPROX DIP OF 28 DEGS~~

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -746 ft Thickness: >35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

~~STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y187~~
~~Basal Information: Depth to Base:2122 Base Elevation: 1954 Thickness: 1241~~
~~Geologic Description:~~
~~Reported Environment:~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks CONTAINS FLAT TOP, BARFIELD, OXTRACK FORMATIONS~~

~~STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y188~~
~~Basal Information: Depth to Base:2122 Base Elevation: 1954 Thickness: 1241~~
~~Geologic Description:~~
~~Reported Environment:~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks CONTAINS BLENHEIM SUB-GP (FLAT TOP, BARFIED, OXTRACK FMS)~~

~~STRATIGRAPHY: GAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y189~~
~~Basal Information: Depth to Base:TD Base Elevation: 21018 Thickness: >130~~
~~Geologic Description: ANDESITE FLOWS (TOPS BRECC), SANDY MUDDY TUFF, VOLC BREC, AND INTRBD F VC TFAC LI LAB SST, LLTST, CARB SH AND COAL~~
~~Reported Environment: TERRESTRIAL IN PART~~ ~~SHALLOW MARINE (HOLLAM ET AL. 1972 P.15)~~
~~Interpreted Environment:~~
~~Geologic Features: Feature Depth Elevation Thickness~~
~~Tectonic Structure:~~
~~Remarks~~

CONTROL POINT: MUNDUBBERA 5-8

REFERENCE # B148

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-5	25 15'00"S	150 10'00"E		168	-2181	2269	C

REFERENCE: GRAY, A.R.G., AND HEYWOOD, P.R.
STRATIGRAPHIC RELATIONSHIPS OF PERMAIN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79 Page 651-664 Publn Year: 1978

Cross Reference: MOLLAN R.G. ET AL. 1972, BMR REPORT NO.142

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:214 Base Elevation: -46 Thickness: 214
Geologic Description: VF-VC LAB-LI LAB SST, LT GN-GY SLTST, DK BR-GY CARB SH , MICAC ANDES ORDAC XL-LI TUFF, PY COAL, MDST & DAC XL-LI TUFF, PY COAL, MDST & MINOR C
Reported Environment: FRESHWATER SWAMPS (MOLLAN & OTHERS, 1972 P.29).
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	70	+98	50
COAL INTERVAL	200	-32	45
?KALOOLA MB	214	-46	135

Tectonic Structure:
Remarks: PALYNOLOGY - PERMIAN UPPER STAGE 5.

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:881 Base Elevation: -713 Thickness: 667
Geologic Description: DK GN-GY CARB MDST & SH, LT GN & GY SANDY CHERTY SLTST, VF-C LAB-LI LAB SST, MINOR LST, TUFF AND CGL; LAMD, SLMPD, SED DYKES; PLT FOSSILS.
Reported Environment: FRESH OR BRACKISH WATER; LACUSTRINE.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PALYNOLOGY - PERMIAN UPPER STAGE 5.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:881 Base Elevation: -713 Thickness: 881
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BARALABA CM AND GYRANDA FM.

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1306 Base Elevation: -1138 Thickness: 418
Geologic Description: CALC & TFAC SLTST; SOME BDS CHERTY; CARB MAT, LEAF FRAGS, PY; MINOR INTBDD TUFF; CRINOID OSSICLES AND TABULATE CORAL; BDG LAMD AND BURROWED.
Reported Environment: NEAR SHORE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS CORRECTED USING DIP TO 10 DEGS IN MUNDUBBERA 6 AND 15 DEGS IN MUNDUBBERA 7; PALYNOLOGY - PERMIAN UPPER STAGE 5

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:2100 Base Elevation: -1932 Thickness: 762
Geologic Description: SILTY CARB PY MDST, LI LAB (TFAC) SST, TUFF & VOLC BREC, GN-GY SLTST, LST; INTBDD; CARB FRAGS & PLT FOSSILS IN PARTS; MARINE FOSSILSANT FOSSILS
Reported Environment: SHALLOW WATER MARINE - DEEP WATER MARINE; REDUCING ENVIRONMENT (MOLLAN & OTHERS, 1972 p.26).
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PASSION HILL FM	1346	-1172	33
ACACIA FM	1487	-1319	142

ORANGE CREEK FM 2188 -1932 587

Tectonic Structure:
Remarks INCLUDES PASSION HILL, ACACIA & ORANGE CK FMS. THICKNESS CORRECTED FOR 15 DG DIP IN MUND. 7 AND 20 DS DIP MUND. 8

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:2122 Base Elevation: -1954 Thickness: 21
Geologic Description: MUDDY LT GY LST (TABULATE CORALS), GY CALC FY SLTST AND GY SILTY CALC FY MDST; BDG LAMINAR TO THICK; CORALS, CRINOID PLATES, BRYOZOANS,BRACH BRA
Reported Environment: SHALLOW MARINE WITH FLUCTUATING ENERGY.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING APPROX DIP OF 20 DEGS.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:2122 Base Elevation: -1954 Thickness: 1201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD & OXTRACK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2122 Base Elevation: -1954 Thickness: 1201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: ure Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GP (FLAT TOP, BARFIELD & OXTRACK FMS)

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -2101 Thickness: 138
Geologic Description: ANDESITE FLOWS (TOPS BRECC), SANDY MUDDY TUFF, VOLC BREC, AND INTBDD F-VC TFAC LI LAB SST, SLTST, CARB SH AND COAL.
Reported Environment: TERRESTRIAL IN PART, & SHALLOW MARINE (HOLLAN & OTHERS, 1972 P.15).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MUNDUBBERA 6

REFERENCE # B148 B

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-5	25 15'00"S	150 12'00"E		164	-627	791	*

REFERENCE: GRAY, A.R.G., AND HEYWOOD, P.B.
STRATIGRAPHIC RELATIONSHIPS OF PERMAIN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79 Page 651-664 Publn Year: 1978
Cross Reference: MOLLAN R.G. ET AL. 1972, BMR REPORT NO.142

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:103 Base Elevation: +61 Thickness: 101
Geologic Description:
Reported Environment: FRESH OR BRACKISH WATER; LACUSTRINE FLUVIAL OR DELTAIC (MOLLAN ET AL. 1972 P.28)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING APPROX DIP OF 10 DEGS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:103 Base Elevation: +61 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GYRANDA FM

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:528 Base Elevation: -364 Thickness: 419
Geologic Description: CALC AND TFAC SLST; SOME BDS CHERTY; CARB MAT, LEAF FRAG, PY; MINOR INTBDD TUFF; CRINOID OSSICLES AND TABULATE CORAL; BDG LAMD AND BURROWED
Reported Environment: NEAR SHORE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING APPROX DIP OF 10 DEGS; PALYNOLOGY - PERMIAN UPPER STAGE 5

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -627 * Thickness: >259
Geologic Description:
Reported Environment: SHALLOW-WATER MARINE DEEP WATER MARINE; REDUCING ENVIRONMENT (MOLLAN ET AL. 1972 P.26)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING APPROX DIP OF 10 DEGS; PALYNOLOGY - PERMAIN UPPER STAGE 5

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -627 * Thickness: >678
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP AND BARFIELD FORMATIONS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -627 * Thickness: >678

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP.

CONTROL POINT: MUNDUBBERA 7

REFERENCE # B148 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-5	25 15'00"S	150 13'00"E		168	-732	900	*

REFERENCE: GRAY, A.R.G., AND HEYWOOD, P.B.
STRATIGRAPHIC RELATIONSHIPS OF PERMAIN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79 Page 651-664 Publn Year: 1978

Cross Reference: MOLLAN R.G. ET AL. 1972, BMR REPORT NO.142

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:198 Base Elevation: -30 Thickness: 191
Geologic Description:
Reported Environment: NEAR SHORE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING APPROX DIP OF 15 DEGS; PALYNOLOGY - PERMAIN UPPER STAGE 5

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interp tion Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -732 * Thickness:)678
Geologic Description: SILTY CARB PY MDST, LI LAB (TFAC) SST, TUFF AND VOLC BREC, GN-GY SLTST, LST; INTBDD; CARB FRAG AND PLT FOSS IN PARTS; MARINE FOSS
Reported Environment: SHALLOW-WATER MARINE DEEP WATER MARINE; REDUCING ENVIRONMENT (MOLLAN ET AL. 1972 P.26)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED USING APPROX DIP OF 15 DEGS; PALYNOLOGY - PERMAIN UPPER STAGE 5

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -732 * Thickness:)869
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP AND BARFIELD FORMATIONS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -732 * Thickness:)869
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

CONTROL POINT: MUNDUBBERA 8

REFERENCE # B148 D

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/56-5	25 14 00	150 14'00"E		193	-465	650	*

REFERENCE: GRAY, A.R.G., AND HEYWOOD, P.B.
STRATIGRAPHIC RELATIONSHIPS OF PERMAIN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79 Page 651-664 Publn Year: 1978
Cross Reference: MOLLAN R.G. ET AL. 1972, BMR REPORT NO.142

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y161
Basal Information: Depth to Base:489 Base Elevation: -296 Thickness: 460
Geologic Description:
Reported Environment: SHALLOW-WATER MARINE DEEP WATER MARINE; REDUCING ENVIRONMENT (MOLLAN ET AL. 1972 P.26)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGY - PERMIAN UPPER STAGE 5

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:5*1 Base Elevation: -318 Thickness: 21
Geologic Description: MUDDY LT GY LST (TABULATE CORALS), GY CALC PY SLTST AND GY SILTY CALC PY MDST; BDG LAMINAR TO THICK; CORALS, CRINOID PLATES, F: /OZOANS, BRACHS
Reported Environment: SHALLOW MARINE WITH FLUCTUATING ENERGY
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:511 Base Elevation: -318 Thickness: 481
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARFIELD AND OXTRACK FORMATIONS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:511 Base Elevation: -318 Thickness: 481
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP.

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -465 * Thickness:)138
Geologic Description: ANDESITE FLOWS (TOPS BRECD), SANDY MUDDY TUFF, VOLC BREC, AND INTBDD F-VC TFAC LI LAB SST, SLIST, CARB SH AND COAL
Reported Environment: TERRESTRIAL IN PART SHALLOW MARINE (MOLLAN ET AL. 1972 P.15)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MUNGI NS 59

REFERENCE # B141

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SG/56-1	24 26'00"S	150 00'22"E	+138	+139	-348	487	

REFERENCE: CHIU CHONG, E.S.
COAL RESOURCES--BARALABA-MOURA-KIANGA-THEODORE COALFIELD MOURA NO. 1--MUNGI AREA
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 73 Page FIG 3 Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: POWEN, SOUTH-EAST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:172 Base Elevation: -33 Thickness:)161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -348 # Thickness:)315
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:172 Base Elevation: -33 Thickness: 161t
Geologic Description: LIGHT GREEN LITHIC-LABILE ARENITES AND INTBDD GREEN AND CHOCOLATE BROWN MUDSTONES. NON-FOSSILIFERROUS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 15-25 DG IN BORE
Remarks THICKNESS CORRECTED FOR 20 DG AVG DIP

STRATIGRAPHY: "PRODUCTIVE MB" Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:484 Base Elevation: -345 Thickness: 235t
Geologic Description: SEE BARALABA CM ABOVE KALOOLA TUFF MB
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 15-65 DG. REVERSE FAULT
Remarks THICKNESS CORRECTED FOR FAULT AND 38 DG AVG DIP. EQUIVALENT TO BARALABA CM ABOVE KALOOLA TUFF MB (NOT USED IN REFERENCE)

STRATIGRAPHY: KALOOLA TUFF MB Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -348 # Thickness:)3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BARALABA CM BELOW MOURA D + E TOPS SEAMS

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -348 # Thickness:)238t

Geologic Description: WHITE LITHIC-LABILE, S'TIMES PEBBLY ARENITES, GREY MUDSTONES, COAL. BASAL KALOOLA TUFF MB BELOW MOURA D + E TOPS SM. FAULT BRECCIAS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL MOURA X+A+B BOT	258	-119	11
COAL MOURA B BOT	335	-196	5
COAL MOURA C	481	-262	7
COAL C BOT FAULTED	449	-310	16

Tectonic Structure: DIPS 15-65 DG. REVERSE FAULT BELOW 435M.
Remarks: ?THICKNESS CORRECTED FOR FAULT AND AVG 38 DG DIP. MOURA C BOT REPEATED (435,449M) DUE TO FAULT.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -348 # Thickness:)238
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS BARALABA CM. THICKNESS CORRECTED FOR 38 DG AVG DIP AND FAULTING

CONTROL POINT: THEODORE NS 37

REFERENCE # 9146

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/56-1	24 52'31"S	150 01'42"E	CA 140	CA 140	-211	351	

REFERENCE:

THIS REPORT — Page: — Publn Year:

Cross Reference: TAYLOR D.A. AND DAVIS A. 1970, GSQ REPORT NO.42
DEAR J.F. ET AL. 1971, GSQ REPORT NO.46

SEDIMENTARY BASIN: BOWEN, SOUTH-EAST

STRATIGRAPHY: REWAN GP — Age: TRIASSIC — Interpretation Code:X101
Basal Information: Depth to Base:80 — Base Elevation: +60 — Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: "PRODUCTIVE MB" — Age: PERMIAN — Interpretation Code:X102
Basal Information: Depth to Base:338 — Base Elevation: -198 — Thickness: 258
Geologic Description: SST, SLTST, SH, COAL SEAMS AND MINOR TFAC SST (TAYLOR AND DAVIS 1970, P.4)
Reported Environment: FRESH-WATER (DEAR ET AL. 1971, P.101)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	153	-13	85
COAL INTERVAL	254	-114	62
COAL INTERVAL	298	-158	34
COAL INTERVAL	330	-190	9

Tectonic Structure:
Remarks: COAL SEAMS INCLUDE NIPAN NO.S 1-10 SEAMS (COAL DATA FROM TAYLOR AND DAVIS 1970, P.4). REP. BARALABA CM ABOVE KALOOLA MB

STRATIGRAPHY: KALOOLA TUFF MB — Age: PERMIAN — Interpretation Code:X103
Basal Information: Depth to Base:TD — Base Elevation: -211 * — Thickness:)13
Geologic Description: TFAC SST AND SH (TAYLOR AND DAVIS 1970, P.4)
Reported Environment: FRESH-WATER (DEAR ET AL. 1971, P.101)
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARALABA CM — Age: PERMIAN — Interpretation Code:X104
Basal Information: Depth to Base:TD — Base Elevation: -211 * — Thickness:)271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks: COAL SEAMS AS FOR "PRODUCTIVE MB". CONTAINS KALOOLA MB AND "PRODUCTIVE MB"

STRATIGRAPHY: BLACKWATER GP — Age: PERMIAN — Interpretation Code:X105
Basal Information: Depth to Base:TD — Base Elevation: -211 * — Thickness:)271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness

Tectonic Structure:
Remarks CONTAINS BARALABA CM ("PRODUCTIVE MB" AND KALOOLA MB WITHIN BARALABA).

BOWEN

BASIN

SW

CONTROL POINT: AAO 7 ARCADIA

REFERENCE # B137Y1
REFERENCE # B137Y2
REFERENCE # B137Y3
REFERENCE # B137X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORE + WIRELINE	SG/55-8	25 17'53"S	148 47'43"E	+372	+374	-626	1000	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
DERRINGTON, S.S.
FINAL REPORT. ASSOCIATED AUSTRALIAN OILFIELDS N.L. WELL A.A.O. NO. 7 ARCADIA
MINES ADMINISTRATION PTY., LTD. REPORT NO. Q/R/33 (UNPUBLISHED)
Page Publn Year: 1957
Cross Reference:

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130
Page 114; TB 5 Publn Year: 1973
Cross Reference:

REFERENCE: Y3
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:105 Base Elevation: +269 Thickness: >100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:297 Base Elevation: +77 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:297 Base Elevation: +77 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:844 Base Elevation: -470 Thickness:

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X135
Basal Information: Depth to Base:844 Base Elevation: -470 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:TD Base Elevation: -626± Thickness: >155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:258 Base Elevation: +116 Thickness: 256
Geologic Description: INTBDD F-M GR, CALC, MICAC, QZ SST, AND LT-M GY MICAC SH; MINOR COAL SMS, SLTST, AND CARB PY SH; SID BNDS AND NOD IN ARG SECTION; PLANT FOSSILS
Reported Environment: FRESH WATER WITH PERIODS OF RAPID, SLOW, AND SEMI-STAGNANT DEPOSITION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL-THIN SMS,BRIGHT	111	+263	8
COAL-THIN SMS,BRIGHT	145	+229	5
COAL-THIN SMS,BRIGHT	171	+203	2
COAL-THIN SMS,BRIGHT	200	+174	2

Tectonic Structure:
Remarks EQUIVALENT TO UPPER BANDANNA FM IN WELL REPORT

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:354 Base Elevation: +20 Thickness: 96
Geologic Description: DK GREY CARBONACEOUS SHALE WITH MINOR INTERBEDS OF FINE GR CALCAREOUS QZ SANDSTONE; PLANT FRAGMENTS
Reported Environment: STAGNANT FRESH WATER SWAMP WITH GENERALLY SLOW RATE OF DEPOSITION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO LOWER BANDANNA FM IN WELL REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:354 Base Elevation: +20 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:451 Base Elevation: -77 Thickness: 98
Geologic Description: LT GREY SILTSTONE WITH MINOR DK GREY SHALE. WORM TRACKS IN SHALY INTERCALATIONS
Reported Environment: FRESH WATER TO LITTORAL

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:671 Base Elevation: -297 Thickness: 219
Geologic Description: DK GREY CARB SH AND MUDSTONE WITH MINOR LT GREY AND GREEN-GREY SH INTBDS; THIN IMPURE LST; MARINE FOSSILS (FORAMS, SPONGE SPICULES, BRACHS)
Reported Environment: DEEP EUXINIC MARINE ENVIRONMENT. ICE RAFTED PBL INDICATE GLACIATION ELSEWHERE IN BASIN
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE	623	-249	3

Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:698 Base Elevation: -324 Thickness: 27
Geologic Description: SANDY PY CALC MUDSTONE, LT AND DK GY SH, BRECCIAS, GRITS, COARSE GRAINED V POORLY SRTD SST, MINOR IMPURE LST; LAMELLIBRANCHS
Reported Environment: SHALLOW, FRESH WATER TORRENTIAL DEPOSITION WITH MINOR MARINE INCURSIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:698 Base Elevation: -324 Thickness: 440
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -626 * Thickness:)302
Geologic Description: UPPER PART - DK GY CALC MDST, SH, LST WITH MINOR F GR SST; MARINE FAUNA; LOWER PART - C QZ SST, SUB-GWKE, LT-DK GY SH, COAL; PLANT FOSSILS
Reported Environment: UPPER PART - MODERATELY DEEP (30-40 M) TO SHALLOW MARINE. LOWER PART - LACUSTRINE WITH RAPID DEPOSITION TO STAGNANT CONDITIONS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	842	-468	14
COAL INTERVAL	994	-620	8
STAIRCASE SST MB	TD		)159

Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -626 * Thickness:)302
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y11(
Basal Information: Depth to Base:TD Base Elevation: -626 * Thickness:)742
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y201
Basal Information: Depth to Base:5 Base Elevation: +369 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:105 Base Elevation: +269 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:320 Base Elevation: +54 Thickness: 215
Geologic Description:
Reported Environment: FLUVIAL WITH LACUSTRINE AND PALUDAL ENVIRONMENTS. COAL MEASURES DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:366 Base Elevation: +8 Thickness: 46
Geologic Description:
Reported Environment: PARALIC ENVIRONMENT. COLD BRACKISH, WATER WITH EUXINIC CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:686 Base Elevation: -312 Thickness: 320
Geologic Description:
Reported Environment: TRANSGRESSIVE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:686 Base Elevation: -312 Thickness: 366
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: BUFFEL FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:644 Base Elevation: -470 Thickness: 158
Geologic Description: CONGLOMERATES AND OTHER CLASTICS, AND LIMESTONE (P.40)

Reported Environment: COLD SHALLOW MARINE CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CLASTICS FROM SOUTHERN PROVENANCE. UNCONFORMABLE ON REIDS DOME BEDS. CATTLE CREEK FM EQUIVALENT

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:844 Base Elevation: -470 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BUFFEL FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:844 Base Elevation: -470 Thickness: 524
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:TD Base Elevation: -626 ± Thickness: >155
Geologic Description: CONTAINS VOLCANOLITHIC SANDSTONE AND PEBBLY CONGLOMERATE (P.34)
Reported Environment: NON-MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:105 Base Elevation: +269 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:300 Base Elevation: +74 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:300 Base Elevation: +74 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:575 Base Elevation: -201 Thickness: 275
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:620 Base Elevation: -246 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:620 Base Elevation: -246 Thickness: 320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:686 Base Elevation: -312 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:686 Base Elevation: -312 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS INGELARA FM

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:TD Base Elevation: -626 * Thickness:)314
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:TD Base Elevation: -626 * Thickness:)314
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:TD Base Elevation: -626 ± Thickness: >314
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, CEBBIE & TIVERTON SUB-GROUPS

CONTROL POINT: AOE 3 CONSUELO

REFERENCE # B127

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	states code
AUST. OIL EXPL.	DDH	SG/55-3	24 33'48"S	148 23'26"E	+301	+305	-1847	1352	

REFERENCE: DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS BULLETIN 130 Page TABLE 5 Publn Year: 1973
Cross Reference: MARCHANT, S., 1974, BUR. MIN. RES. RECORD 1974/151 (FOR LOCATION DETAILS)

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:664 Base Elevation: -359 Thickness:)660
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -301 M(AT SURFACE) VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:664 Base Elevation: -359 Thickness: 660
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:664 Base Elevation: -359 Thickness: 660
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -1047# Thickness:)688
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -1047# Thickness:)688
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -1047# Thickness:)688

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks CONTAINS ALDEBARAN SST (GEBBIE SUB-GP) & CATTLE CREEK FM (TIVERTON SUB-GP).

CONTROL POINT: ARCTURUS 1

REFERENCE # B107Y1
REFERENCE # B107Y2
REFERENCE # B107Y3
REFERENCE # B107X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FREMEY OIL	RDH, CORE + WIRELINE	SG/55-3	24 03'40"S	148 30'00"E	+180	+184	-1707	1891	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.F.D. ARCTURUS NO.1 WELL, QUEENSLAND. WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT NO. Q/55-56P/209. (BMR FILE 64/4095)
Page Publn Year: 1965
Cross Reference: MOLLAN, R.G., ET.AL,1969, BMR REPORT 123

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130
Page 114; TRL 5 Publn Year: 1973
Cross Reference: JACKSON, K.S., ET.AL., 1988, APEA JOUR V. 20(1), P143-158

REFERENCE: Y3
BALFE,P.E.
PERMIAN STRATIGRAPHY OF THE SPRINGSURE-ARCTURUS DOWNS AREA
QUEENSLAND GOVERNMENT MINING JOURNAL
Page 133-159 Publn Year: 1982
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:162 Base Elevation: 22 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:440 Base Elevation: -256 Thickness: 278
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:440 Base Elevation: -256 Thickness: 278
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:524 Base Elevation: -340 Thickness: 84

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:652 Base Elevation: -468 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:? Base Elevation: ? Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATHERINE SST PROBABLE NOT PRESENT SO PEAWADDY-INGELARA BOUNDARY DIFFICULT TO PICKED

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:? Base Elevation: ? Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PEAWADDY-INGELARA BOUNDARY UNCERTAIN

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:951 Base Elevation: -767 Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PEAWADDY-INGELARA BOUNDARY DIFFICULT TO PICK

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:1039 Base Elevation: -855 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:1676 Base Elevation: -1492 Thickness: 637
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOWER PART OF SEQUENCE CORRESPONDS TO STAIRCASE SST OF BALFE(1982)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:1676 Base Elevation: -1492 Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF UNIT UNCERTAIN. CONTAINS INGELARA, FREITAG AND ALDEBARAN.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:TD Base Elevation: -1707* Thickness: >215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:TD Base Elevation: -1707* Thickness: >215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X114
Basal Information: Depth to Base:TD Base Elevation: -1707* Thickness: >1451
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLACK ALLEY, CROCKER, PEAWADDY, INGELARA, FREITAG, ALDERARAN, CATTLE CREEK FM.

STRATIGRAPHY: VOLCANICS Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:38 Base Elevation: +146 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:335 Base Elevation: -151 Thickness: 297
Geologic Description: MOSTLY SLTST AND SH, WITH POORLY SORTED FINE SST IN LOWER HALF. SLTST IS GY-GN TO BL, ARG, MICAC, QZOSE. SH IS BL-GY AND CARBONACEOUS
Reported Environment: PALUDAL, FLUVIAL (HOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	209	-25	3
COAL	235	-51	2
COAL	241	-57	1
COAL	248	-64	2

Tectonic Structure:
Remarks REPRESENTS UPPER BANDANNA IN COMPLETION REPORT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:335 Base Elevation: -151 Thickness: 297
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y184
Basal Information: Depth to Base:527 Base Elevation: -343 Thickness: 192
Geologic Description: BROWNISH-BLACK CARBONACEOUS SH AND SLTST GRADING TO COAL. CALCAREOUS SST COMMON IN BASE. AREN LST IN MIDDLE.
Reported Environment: PARALIC ENVIRONMENTS TRANSITIONAL FROM MARINE TO TERRESTRIAL (MOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE, AREN	411	-227	<5

Tectonic Structure:
Remarks REPRESENTS LOWER BANDANNA IN COMPLETION REPORT. LST AT -209 M ON WELL LOG

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:952 Base Elevation: -768 Thickness: 425
Geologic Description: SST WITH MINOR SLTST, SH, COAL IN UPPER SEQ. SLTST WITH MINOR SST BELOW.SH IS BN-BLK, CARB, PY. SLTST IS DK GY, CARB, CALC. SST IS F-M GRAINED
Reported Environment: DEPOSITED IN EXTENSIVE SHALLOW BASIN VARYING FROM NORMAL MARINE TO RESTRICTED BRACKISH WATER (MOLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	542	-358	3
COAL	567	-383	
COAL	582	-398	2
COAL	599	-415	1

Tectonic Structure:
Remarks REPRESENTS DRY CREEK SH IN WELL REPORT. COAL ALSO AT 626 M DEPTH (-442 MSL, 1 M THICK). P3C SPORES 527 M (-343 MSL), P3B

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:952 Base Elevation: -768 Thickness: 617
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM.

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:1003 Base Elevation: -819 Thickness: 51
Geologic Description: SST WITH SLTST AND MINOR SH. SST IS F-M, POOR SORT, WITH ARG AND CALC MATRIX. SLTST IS ARG AND CALC IN PART. SH IS LT BROWN AND PYRITIC
Reported Environment: SHALLOW MARINE AND PARALIC. POSSIBLY POORLY DEVELOPED SAND BARS (MOLLAN, 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS EARLY STORMS SST IN WELL REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:1046 Base Elevation: -856 Thickness: 37
Geologic Description: SLTST WITH MINOR SST AND SH. SLTST IS GY-BLK, ARG AND CARB. SH IS WH, SPECKLED, OR BLK, AND IS CARB. SST IS F-M, POOR SORT, AND ARGILLACEOUS
Reported Environment: RAPID DEPOSITION IN RESTRICTED MARINE CONDITIONS (MOLLAN, 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
P3B SPORES T'OUT SEQ
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y189

Basal Information: Depth to Base:1678 Base Elevation: -1494 Thickness: 638
Geologic Description: QZ SST WITH MINOR SLTST, SH, COAL. SST IS F-C, POOR SORT, AND SILICIFIED. SLTST AND SH ARE DARK BROWN TO BLACK AND CARBONACEOUS
Reported Environment: BRACKISH DELTAIC SEDIMENTATION. PROGADATION OF DELTAIC SANDS ALTERNATED WITH SLOW SILTY DEPOSITION (HOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
P3B SPORES	1050	-866	10
COAL	1125	-941	2
COAL	1293	-965	2
COAL	1375	-1191	2

Tectonic Structure:
Remarks PRE P3B SPORES AT 1398 M, 1532 M, AND 1644 M DEPTH.

STRATIGRAPHY: CEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1678 Base Elevation: -1494 Thickness: 726
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA SH, ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -1707* Thickness: >213
Geologic Description: DARK CARBONACEOUS SHALE WITH MINOR SANDSTONE AND SLTST
Reported Environment: RAPID DEPOSITION IN SHALLOW MARINE RESTRICTED BASINS (HOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
SANDSTONE	1792	-1608	15

Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1707* Thickness: >213
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -1707* Thickness: >1556
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GR (BLACK ALLEY, PEAWADDY), GEBBIE SUBGR (CATHERINE, INGELARA, ALDEBARAN), TIVERTON SUB-GR (CATTLE CREEK)

STRATIGRAPHY: UNDIFF POST-TRIASSIC Age: POST-TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:43 Base Elevation: +141 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:189 Base Elevation: -5 Thickness: 146

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:448 Base Elevation: -264 Thickness: 259
Geologic Description:
Reported Environment: TERRESTRIAL. FLUVIAL, LACUSTRINE AND PALUDAL COALS DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:482 Base Elevation: -298 Thickness: 34
Geologic Description:
Reported Environment: COLD BRACKISH WATER WITH EUXINIC CONDITIONS. TRANSITIONAL FROM MARINE TOFRESH WATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK CM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:649 Base Elevation: -465 Thickness: 168
Geologic Description:
Reported Environment: MARINE AND AT TIMES BRACKISH DELTA (FLUVIAL COAL-BEARING FACIES, JACKSON, ET.AL., 1980)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SHALE AT 595.6 M DEPTH WITH VTRF OF 0 64. ASCRIBED TO BANDANNA FM (JACKSON, ET.AL., 1980)

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:951 Base Elevation: -767 Thickness: 302
Geologic Description:
Reported Environment: MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:951 Base Elevation: -767 Thickness: 504
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH, GERMAN CREEK CM, AND PEAWADDY FM.

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1012 Base Elevation: -828 Thickness: 61
Geologic Description:
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y269
Basal Information: Depth to Base:1039 Base Elevation: -855 Thickness: 27
Geologic Description:
Reported Environment: RELATIVELY DEEP MARINE WITH EUXINIC CONDITIONS AND LITTLE REWORKING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1676 Base Elevation: -1492 Thickness: 637
Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1676 Base Elevation: -1492 Thickness: 725
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -1707± Thickness:)215
Geologic Description:
Reported Environment: GENERALLY MARINE WITH BRACKISH-FRESHWATER ENVIRONMENTS EXISTING AT TIMES AROUND BASIN MARGIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -1707± Thickness:)215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y214
Basal Information: Depth to Base:TD Base Elevation: -1707± Thickness:)1444
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLACK ALLEY SH, GERMAN CK CM, PEAWADDY FM OF BLENHEIM SUB-GR; CATHERINE SST, INGELARA FM, ALDEBARAN SST-GEBBIE SUB-GR;

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y381
Basal Information: Depth to Base:646 Base Elevation: -462 Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ? TOP OF SEQUENCE NOT GIVEN IN SOURCE

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:646 Base Elevation: -462 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:712 Base Elevation: -528 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:712 Base Elevation: -528 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:829 Base Elevation: -645 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:953 Base Elevation: -769 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:1052 Base Elevation: -868 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:1497 Base Elevation: -1313 Thickness: 445

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: STAIRCASE SST MB Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:1679 Base Elevation: -1495 Thickness: 182
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CREEK FM

STRATIGRAPHY: MOORODLOO MDST MB Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:1778 Base Elevation: -1594 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CREEK FM

STRATIGRAPHY: RIVERSTONE SST MB Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:1812 Base Elevation: -1628 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CREEK FM

STRATIGRAPHY: MOSTYNDALE MDST MB Age: PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:TD Base Elevation: -1707# Thickness: >79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CREEK FM

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y313
Basal Information: Depth to Base:1497 Base Elevation: -1313 Thickness: 785
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM, FREITAG FM, ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y314
Basal Information: Depth to Base:TD Base Elevation: -1707# Thickness: >394
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y315
Basal Information: Depth to Base:TD Base Elevation: -1707# Thickness:)374
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y316
Basal Information: Depth to Base:TD Base Elevation: -1707# Thickness: 1245
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MACMILLAN, CATHERINE, INGELARA, FREITAG, ALDEBARAN AND CATTLE CREEK

CONTROL POINT: BANDANNA 1

REFERENCE # B133Y1
REFERENCE # B133Y2
REFERENCE # B133Y3
REFERENCE # B133X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH, CORE, WIRELINE	SG/55-7	25 96'40"S	148 17'20"E	+433	+436	-796	1232	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
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ASSOCIATED FRENEY OIL FIELDS N.L.UNPUB REP Q/55-56P/129 BMR FILE 63/1310
Page Publn Year: 1963
Cross Reference:

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GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 110-130 Publn Year: 1980
Cross Reference:

REFERENCE: Y3
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130
Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:-287 Base Elevation: +723 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNIT NOT IN WELL. DATA RECONSTRUCTED ABOVE WELL INTERSECTION FROM NEARBY OUTCROP DATA. REF. BMR REPT. 123 PL.8

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:-165 Base Elevation: +601 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNIT NOT IN WELL. DATA RECONSTRUCTED ABOVE WELL INTERSECTION FROM NEARBY OUTCROP DATA. REF. BMR REPT. 123 PL.8

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:-165 Base Elevation: +601 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNIT NOT IN WELL. DATA RECONSTRUCTED ABOVE WELL INTERSECTION FROM NEARBY OUTCROP DATA. REF. BMR REPT. 123 PL.8

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:-41 Base Elevation: +477 Thickness: 124

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNIT NOT IN WELL. DATA RECONSTRUCTED ABOVE WELL INTERSECTION FROM NEARBY OUTCROP DATA. REF. BMR REPT. 123 PL.8

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:91 Base Elevation: +345 Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNIT ONLY PARTLY IN WELL. DATA RECONSTRUCTED ABOVE WELL INTERSECTION FROM NEARBY OUTCROP DATA. REF. BMR REPT 123 PL.8

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:243 Base Elevation: +193 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:432 Base Elevation: +4 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X170
Basal Information: Depth to Base:643 Base Elevation: -207 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X175
Basal Information: Depth to Base:643 Base Elevation: -207 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X180
Basal Information: Depth to Base:TD Base Elevation: -796% Thickness: >589
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:64 Base Elevation: +372 Thickness: 61
Geologic Description: LT GY F-M QZOSE SST WITH POOR-FAIR SRTG MINOR CARB MAT AND PY AND ARG MATRIX, DK GY ARG CARB SLTST AND DK BR CARB (PARTLY MICAC AND SILTY) SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "EARLY STORMS SST" IN COMPLETION REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:243 Base Elevation: +193 Thickness: 179
Geologic Description: M-DK GY QZOSE ARG CARB CALC PARTLY MICAC SLTST WITH TRACE PY, M-DK GY CARB SILTY SH - SLTST AND MINOR LT GY F QZOSE ARG SST; BRACH FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:432 Base Elevation: +4 Thickness: 189
Geologic Description: WH F-C (PARTLY PBLY) DOM QZOSE WELL SRTD SST WITH ARG MATRIX, MINOR LT GY QZOSE ARG SLTST WITH CARB SPECKS AND GY MICAC CARB SILTY SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:432 Base Elevation: +4 Thickness: 429
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:685 Base Elevation: -249 Thickness: 253
Geologic Description: GY QZOSE ARG MICAC CALC CARB SLTST, LT GY ARG SILTY LST - SLTST AND MINOR F QZOSE ARG SST; BRACH SPINES, SHELL AND BRYOZOA FRAGMENTS T'OUT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:685 Base Elevation: -249 Thickness: 253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:685 Base Elevation: -249 Thickness: 682
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF GEBBIE SUB-GP (CATHERINE SST, INGELARA FM, ALDEBARAN SST) AND TIVERTON SUB-GP (CATTLE CREEK FM)

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -796 ± Thickness: >547
Geologic Description: WH M-C QZ-FLD-LT FAIRLY SORTED SST WITH ARG MATRIX, GY ARG CARB SLTST, DK GY-DK BR CARB MICAC SH, BLK VITREOUS COAL; PLANT FOSSILS
Reported Environment: FRESHWATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 1225 -789 540
Tectonic Structure:
Remarks CALLED "UNIT 8" IN COMPLETION REPORT. COAL OCCURS THROUGHOUT THIS FM

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:64 Base Elevation: +372 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:183 Base Elevation: +253 Thickness: 119
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:243 Base Elevation: +193 Thickness: 60
Geologic Description:
Reported Environment: TRANSGRESSIVE; DEPOSITION REPRESENTS RETURN TO MARINE CONDITIONS (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:432 Base Elevation: +4 Thickness: 189
Geologic Description:
Reported Environment: LOWER BEDS MARINE IN PART; EXTENSIVE REGRESSION (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:432 Base Elevation: +4 Thickness: 429
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM, FREITAG FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y206

Basal Information: Depth to Base:685 Base Elevation: -249 Thickness: 253
Geologic Description:
Reported Environment: MARINE; MAJOR TRANSGRESSION (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:685 Base Elevation: -249 Thickness: 253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:685 Base Elevation: -249 Thickness: 683
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCELARA FM, FREITAG FM AND ALDEBARAN SST OF DEBRIE SUBGROUP AND CATTLE CREEK FM OF TIVERTON SUBGROUP

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -796 # Thickness: >547
Geologic Description:
Reported Environment: DEPOSITED DURING INITIAL SUBSIDENCE OF DENISON TROUGH; PALUDAL AND DELTAIC (P.114-115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:91 Base Elevation: +345 Thickness: 88
Geologic Description:
Reported Environment: MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:91 Base Elevation: +345 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:146 Base Elevation: +290 Thickness: 55
Geologic Description:
Reported Environment: DEPOSITED IN RAPIDLY SUBSIDING MARINE BASIN (P.119)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:436 Base Elevation: 0 Thickness: 298
Geologic Description:
Reported Environment: MAINLY DELTAIC (P.119)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:436 Base Elevation: 0 Thickness: 345
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:643 Base Elevation: -207 Thickness: 207
Geologic Description:
Reported Environment: MARINE (P.118)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:643 Base Elevation: -207 Thickness: 207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:643 Base Elevation: -207 Thickness: 640
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:TD Base Elevation: -796 # Thickness: >589
Geologic Description:
Reported Environment: NON-MARINE (P.32)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BUCKLAND NS 1

REFERENCE # B127

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/55-3	24 39'24"S	147 42'14"E	+537	+537	+360	177	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, SPRINGSURE SHELF PROGRAMME, WESTERN BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/37 Page FIGURE 3 Publn Year: 1974
Cross Reference: MOLLAN, 1969, BMR REPORT 123, P40-41

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:20 Base Elevation: +517 Thickness: >20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:60 Base Elevation: +477 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:60 Base Elevation: +477 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:20 Base Elevation: +517 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:60 Base Elevation: +477 Thickness: 40
Geologic Description: INTERBEDDED MDST AND SLTST WITH LESSER SST. PLANT FOSSILS IN TOP, BRECCIA IN BOTTOM
Reported Environment: PALUDAL AND LACUSTRINE WITH SOME FLUVIAL INFLUENCE (MOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	20	+517	1
COAL	23	+514	1
TUFFACEOUS INTERVAL	25	+512	17
TUFF	59	+478CA	

Tectonic Structure: EAST-WEST STRIKE AND GENTLE DIP TO SOUTH

Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:60 Base Elevation: +477 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:111 Base Elevation: +426 Thickness: 51
Geologic Description: INTERBEDDED SST AND SLTST WITH MDST AND LST IN BOTTOM OF SEQ. PLANT FOSSILS IN UPPER SEQ, BURROWS IN MIDDLE.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE	99	+438	<1
TUFF	102	+435CA	
LIMESTONE	106	+431	1
TUFF	109	+428	

Tectonic Structure: EAST-WEST STRIKE AND GENTLE DIP TO SOUTH
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +360 ± Thickness: >66
Geologic Description: BIOTURBATED SLTST AND MDST. ARGILLACEOUS TOWARD TOP. MARINE FAUNA
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF INTERVAL	111	+426	24

Tectonic Structure: EAST-WEST STRIKE AND GENTLE DIP TO SOUTH
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: +360 ± Thickness: >117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES BLACK ALLEY SHALE AND PEAWADDY FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: +360 ± Thickness: >117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES BLENHEIM SUB-GP, BLACK ALLEY SH AND PEAWADDY FM.

CONTROL POINT: BURN MEADOWS EM 10

REFERENCE # 883

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-15	23 29'44"S	147 57'47"E	CA+231	CA+201	-559	760	

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 30-38;PL 1 Publn Year: 1964

Cross Reference: DICKINS J.M. AND MALONE E.J., 1973, BMR BULLETIN 130, P45

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -559 # Thickness:)760
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 201 M(AT SURFACE).VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -559 # Thickness:)760
Geologic Description: M-C QZ SST WITH QZ CONGLOMERATE AND CLAYEY SST. THIN BDD AND SOME XBDG.
Reported Environment: DELTAIC AND PARTLY BRACKISH (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INTERMITTENT EXPOSURE ON WESTERN LIMB OF ANTICLINE

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -559 # Thickness:)760
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -559 # Thickness:)760
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST OF GEBBIE SUB-GROUP.

CONTROL POINT: CAPELLA EM 2/1-6

REFERENCE # BS9

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-15	23 06'28"S	147 48'53"E	+230	+230	+50	180	

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 34-36;PL 1 Publn Year: 1964

Cross Reference: OLGERS F 1969 EMERALD 1:250,000 EXPLANATORY NOTES

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +50 m Thickness: >180
Geologic Description: QZ SST, CGL, SLTST, MICAC AND CARB MDST; UPPER BEDS CONTAIN QZ AND SCHIST ERRATICS. LOOSE PRODUCTIDS.
Reported Environment: MARINE AND FRESHWATER (OLGERS,1969?)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIP 3-10 DEGREES SE.
Remarks POORLY EXPOSED CREEK SECTION. COAL(MAY BE BLACKWATER GROUP) IS EXPOSED TO EAST OF SECTION (+355 M ASL) AND IS 2.3 M THK.

CONTROL POINT: CARDA

REFERENCE # B69

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF'55-15	23 15'41"S	147 57'56"E	+195	+195	-734	929	C

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 30-33;PL 1 Publn Year: 1964

Cross Reference: DICKINS AND MALONE 1973 BMR BULLETIN 130, 45, PLATE 1

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -734 m Thickness: >915
Geologic Description: INTBDD QZ AND FELD SST (COMMONLY XBDD), PEBBLY SST, MICAC AND CARB SLTST, AND SH; WORM TUBES AND CASTS; ,RARE PLANT FOSSILS; MUDCRACKS AT TOP
Reported Environment: DELTAIC (PROBABLY PARTLY BRACKISH - DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 5-15 DG. 10 DG AVG DIP
Remarks TD=APPARENT THICKNESS AT 10 DG DIP. SECTION PROJECTED BELOW YOUNGEST ROCKS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -734 m Thickness: >915
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED GEBBIE SUB-GROUP. COAL REPORTED IN CRYSTAL CREEK BORE (9 KM WSW OF TOP OF SECTION) AT +167 MSL

CONTROL POINT: COMETSIDE 1

REFERENCE # B123Y1
REFERENCE # B123Y2
REFERENCE # B123X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ANAL. PET. EXPL.	RDH, CORE + WIRELINE	SG/55-4	24 39'00"S	148 48'00"E	251	254	-1441	1695	?

REFERENCE: X1 THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA BULLETIN 130
Page 114; TB 5 Publn Year: 1973
Cross Reference:

REFERENCE: Y2 GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL V.81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:259 Base Elevation: -5 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:530 Base Elevation: -276 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:530 Base Elevation: -276 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1021 Base Elevation: -767 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1196 Base Elevation: -953 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 453
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X155
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 453
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:TD Base Elevation: -1441* Thickness: >136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:259 Base Elevation: -5 Thickness: 255
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:530 Base Elevation: -276 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:634 Base Elevation: -380 Thickness: 104
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:935 Base Elevation: -731 Thickness: 351
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:905 Base Elevation: -731 Thickness: 455
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLACK ALLEY SH, PEAWADDY FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1116 Base Elevation: -862 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1116 Base Elevation: -862 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 443
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 443
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 1300

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -14418 Thickness: >136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:427 Base Elevation: -173 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks 197 M OF SEQUENCE IS NOT INTERPRETTED ABOVE BANDANNA FM.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:427 Base Elevation: -173 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEQUENCE NOT INTERPRETTED ABOVE BANDANNA FM 197 M TO SURFACE

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:634 Base Elevation: -380 Thickness: 207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:835 Base Elevation: -581 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BOUNDARY WITH UNDERLYING INGELARA SH IS UNCERTAIN

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:835 Base Elevation: -581 Thickness: 408
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLACK ALLEY SH, PEAWADDY FM. BASE IS UNCERTAIN

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:987 Base Elevation: -733 Thickness: 152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BOUNDARY WITH OVERLYING PEAWADDY FM IS UNCERTAIN

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1021 Base Elevation: -767 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1106 Base Elevation: -852 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEMBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1106 Base Elevation: -852 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INGELARA FM, FREITAG FM, ALDEBARAN SST. BOUNDARY WITH OVERLYING PLENHEIM SUB-GP IS UNCERTAIN.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 453
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 453
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:1559 Base Elevation: -1305 Thickness: 732
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BANDANNA FM, BLACK ALLEY SH, INGELARA FM, FREITAG FM, ALDEBARAN SST, CATTLE CREEK FM.

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -1431' Thickness:)126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TD IS 10M LESS THAN DICKINS & MALONE

CONTROL POINT: CONSUELO NS 2

REFERENCE # B131	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	GEOL. SURV. QLD.	DDH	SG/55-3	24 57'48"S	148 20'11"E	+358	+358	+175	183	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, CONSUELO PROGRAMME, SOUTH-WEST BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/13 Page FIG 4 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRASSIC Interpretation Code:X
Basal Information: Depth to Base:67 Base Elevation: +291 Thickness:)67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +175 # Thickness:)113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +175 # Thickness:)113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:67 Base Elevation: +291 Thickness: 67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: ON SW FLANK OF REIDS DOME ANTICLINE
Remarks SURFACE STRIKE NORTH-SOUTH, DIP 21 DG EAST, SUBSURFACE DIP 12 DG, NO CORRECTION

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +175 # Thickness:)113
Geologic Description: INTBDD SLTST, MDST, SST, AND SH. THICK XBDD SST. CARB-COALY PARTINGS, PLANT FOSSILS
Reported Environment: FLUVIAL AND DELTAIC DEPOSITS OF CHANNEL SST AND INTERDISTRIBUTARY CHANNEL SEDIMENT
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	186	+252	2
COAL	117	+241	1
COAL	129	+229	3
COAL	167	+191	(1

Tectonic Structure: DIPS 12-15 DG EAST IN HOLE

Remarks THICKNESS CORRECTED FOR 13 DG DIP

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: TD Base Elevation: +175 ft Thickness: >113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: CONTAINS BANDANNA FM
Remarks

CONTROL POINT: DENISON NS 1

REFERENCE # B111

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/55-3	24 14'20"S	148 29'20"E	+203	+204	+22	182	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, DENISON PROGRAMME, SOUTH WEST BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1975/23 Page FIG 2 Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +22 * Thickness:)36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: +22 Thickness:)123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:59 Base Elevation: +145 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:146 Base Elevation: +145 Thickness: 87
Geologic Description: INTERBEDDED SHALE, SILTSTONE, MUDSTONE, SANDSTONE, AND COAL. PLANT REM AINS ARE COMMON.
Reported Environment: PALUDAL AND LACUSTRINE WITH FLUVIAL (SANDSTONE) INFLUENCES (MOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SMS	81	+123	2
COAL SMS	96	+108	4
COAL SM	101	+103	2
COAL SM	118	+86	2

Tectonic Structure: ON AXIS OF INDERI ANTICLINE, GENTLE DIP
Remarks

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +22 * Thickness:)36
Geologic Description: INTERBEDDED SILTSTONE AND SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFFS, SEVERAL BEDS	146	+58	6

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code: Y184
Basal Information: Depth to Base: TD Base Elevation: +22 # Thickness: >123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES RANGAL CM AND BURNGROVE FM

CONTROL POINT: DENISON NS 1B

REFERENCE # B96

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-15	23 50'33"S	148 13'32"E	+190	+191	-259	450	

REFERENCE: WALLIN, C.I.
DEPARTMENTAL DRILLING, EMERALD-SPRINGSURE AREA, SOUTHWEST AND SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/46 Page Publ. Year: 1979
Cross Reference: PROUZA V 1977, GSQ RECORD 1977/27, B-11/PARK W.J. 1973, GSQ RECORD 1973/28, 9-11

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:284 Base Elevation: -93 Thickness: >159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -259 * Thickness: >97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -259 * Thickness: >166
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:125 Base Elevation: +66 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:284 Base Elevation: -93 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:353 Base Elevation: -162 Thickness: 69

Geologic Description: LIGHT GREY ARENITE WITH GREY SLTST AND MDST; SEVERAL COAL SEAMS. INTBDD, PARALLEL, WAVY BDG, XBDG. PLANT FOSSILS
Reported Environment: DELTAIC. (PARLY FLUVIAL AND PARTLY PALUDAL - PROUZA, 1977)
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	292	-181	2
COAL	302	-111	<1
COAL	315	-124	
COAL	325	-134	<1

Tectonic Structure: WEST LIMB OF SYNCLIN RIUM, NE DENISON TR
Remarks: VERY LOW DIP, 2-3 DG.

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -259 * Thickness: >97
Geologic Description: LIGHT GREY-GREEN ARENITE WITH MUDSTONE, SILTSTONE, AND TUFF; XBDG, PARALLEL BDG, BIOTURBATION; PLANT FOSSILS
Reported Environment: PRO-DELTA - DELTAIC - SUB-AERIAL WITH SOME MARINE INFLUENCE (PARK, 1973)
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
TUFFACEOUS MUDSTONE	358	-167	6
TUFF	368	-177	<1
TUFF	383	-192	2
COAL	426	-235	<1

Tectonic Structure: VERY LOW DIPS, 2-4 DEGREES
Remarks:

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -259 * Thickness: >166
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS RANGAL CM AND BURNGROVE FM.

CONTROL POINT: DENISON NS 22/24R

REFERENCE # 886

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, OPEN AND CORED	SF/55-15	23 37'46"S	148 18'57"E	+207	+207	-18	225	

REFERENCE: WALLIN, C.I.
DEPARTMENTAL DRILLING, EMERALD-SPRINGSURE AREA, SOUTHWEST AND SOUTH CENTRAL, BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/46 Page FIGURE 8 Publn Year: 1979

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -18 Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -18 * Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:122 Base Elevation: +85 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -18 * Thickness:)84+
Geologic Description: MOSTLY GN-GY LITHIC SST WITH TFAC MATRIX AND BECOMING MORE ARG TOWARD BASE. PLANT FOSSILS, CARB LAMINAE, XRDS, BIOTURBATION
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	194	+13	0.3

Tectonic Structure: DIPS 20-30 DG, <S AT BASE.
Remarks: THICKNESS CORRECTED FOR 35 DG DIP

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -18 * Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BURNGROVE FM

CONTROL POINT: DENISON NS 25

REFERENCE # D99

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SG/55-3	24 08'31"S	147 53'22"E	311	312	108	204	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL COAL DRILLING, SOUTHWEST BOWEN BASIN LEXTON-VANDYKE AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/35 Page FIG 2 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:160 Base Elevation: +152 Thickness:)160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 312 M VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:160 Base Elevation: +152 Thickness: 157t
Geologic Description: TOP HALF F-C WH AND DK-GY SUB-LAB TO QZOSE SST AND GY TO DK-GY CARB MDST, BIOTURB, PLANT DEBRIS, COAL LAM; BOT M-VC QZOSE SST. XBDD INTBDD M-BDD
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 4-12 DG
Remarks THICKNESS CORRECTED FOR 8 DG DIP

STRATIGRAPHY: GERBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:160 Base Elevation: +152 Thickness: 157
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:160 Base Elevation: +152 Thickness: 157
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: TELEMON FM Age: DEVONIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +108 M Thickness:)41t
Geologic Description: MDST WITH MINOR SST AND SLTST INTBDS. COLOUR IRREG MOTTLED LT-GN, GN, LT-GY, GY, RD-BN. SAND DYKES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIP CHANGES SHARPLY AT BOTTOM 12-35 DG.
Remarks THICKNESS CORRECTED FOR 20 DG DIP

CONTROL POINT: DENISON NS 28

REFERENCE # B186

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/55-3	24 96'45"S	148 24'33"E	+200	+201	-94	295	

REFERENCE: WALLIN, C.I.
DEPARTMENTAL DRILLING, EMERALD-SPRINGSURE AREA, SOUTHWEST AND SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/46 Page FIGURE 19 Publn Year: 1979

Cross Reference: MOLLAN ET AL 1969 BMR REPT 123 P35-41

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:200 Base Elevation: +1 Thickness: >99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -94 * Thickness: >27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -94 * Thickness: >95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:101 Base Elevation: +100 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:200 Base Elevation: +1 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS APPROXIMATE.

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:268 Base Elevation: -67 Thickness: 68

Geologic Description: GREY LITHIC SST AND INTBDD SANDY MUDST AND SLTST. SILTY CARBONACEOUS LENSES COMMON IN TOP. NUMEROUS PLANT FOSSILS
Reported Environment: PALUDAL AND LACUSTRINE WITH FLUVIAL SAND DEPOSITION (HOLLAN, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 2 SEAMS	284	-3	3
COAL	223	-22	1
COAL	234	33	22
COAL	248	-47	2

Tectonic Structure:
Remarks: COAL, 258 M DEPTH, 1 M THICK

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y184
Basal Information: Depth to Base:TD Base Elevation: -94 * Thickness: >27
Geologic Description: GREEN-GREY LITHIC SST AND SANDY SLTST, MORE ARGILLACEOUS TOWARD BOTTOM.SOME BIOTURBATION AND NUMEROUS PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -94 * Thickness: >95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES RANGAL CM AND BURNGROVE FM

CONTROL POINT: DENISON NS 29

REFERENCE # B98 X1
REFERENCE # B98 Y1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD	DDH, CORED	SF/55-15	23 46'57"S	147 54'22"E	245	246	-70	315	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference: MCCLUNG, 1981, GSQ RECORD 1981/10, FIG 2 FLEMING,1982, QHJ V.83, P.284-292, FIG.5.

REFERENCE: Y1 ANDERSON, J.C.
DEPARTMENTAL COAL DRILLING, SOUTHWEST BOWEN BASIN LEXTON-VANDYKE AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/35 Page FIG 3 Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:72 Base Elevation: 174 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SEDIMENTS Age: TERTIARY Interpretation Code:X102
Basal Information: Depth to Base:152 Base Elevation: 94 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:230 Base Elevation: 16 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:230 Base Elevation: 16 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:230 Base Elevation: 16 Thickness: 78
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:300 Base Elevation: -54 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -708 Thickness: 315
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:72 Base Elevation: +174 Thickness: 71
Geologic Description: GREEN-BLACK BASALT, WITH CLAY AT BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SEDIMENTS Age: TERTIARY Interpretation Code:Y102
Basal Information: Depth to Base:152 Base Elevation: +94 Thickness: 80
Geologic Description: CLAYSTONE WITH MINOR SILTSTONE AND SHALE. SH WITH CARB LAM, PLANT MATERIAL BETWEEN 90-100 M DEPTH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:301 Base Elevation: -55 Thickness: 149?
Geologic Description: SST WITH INTBDD SLTST(TOP), CGL, MDST, THIN COAL BDS-LAM(BOT). LT-GY TO GY,F-M GRAIN, LAB,ARG. MEDIUM BDD, BIOTURB(TOP). MARINE FOSS PLANT DEB
Reported Environment:
Interpreted Environment:
Geologic Features. Feature Depth Elevation Thickness
Tectonic Structure: 35 DG DIP, MINOR FAULTS, FRACTURES
Remarks WEATHERED AT TOP. THICKNESS NOT CORRECTED FOR DIP SINCE EXTENT OF DISTURBANCE NOT CLEAR. FAULTS, FRACTURES AT 250 M DEP

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:301 Base Elevation: -55 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y105

Basal Information: Depth to Base:304 Base Elevation: -55 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: TELEMON FM Age: DEVONIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -70 ± Thickness: >14
Geologic Description: MDST, CGL, AND VC SST. GN PURP PINK AND MAUVE. VOLCANIC AND QUARTZ PEBBLES TO BOULDERS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DENISON NS 31/36R

REFERENCE # D57

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-15	23 39'48"S	148 15'35"E	+155	+156	-466	622	

REFERENCE: WALLIN, C.I.
DEPARTMENTAL DRILLING, EMERALD-SPRINGSURE AREA, SOUTHWEST AND SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/46 Page Publn Year: 1979

Cross Reference: PROUZA V 1977, GSQ RECORD 1977/27, B-11/JENSEN AR 1975, BMR BULLETIN 154, 138-13 9

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:561 Base Elevation: -405 Thickness: >419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -466 # Thickness: >21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -466 # Thickness: >61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:142 Base Elevation: +15 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:561 Base Elevation: -405 Thickness: 419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:601 Base Elevation: -445 Thickness: 40
Geologic Description: MUDSTONE, SILTSTONE, AND ARENITE; CARBONACEOUS IN PARTS; AREN AND CARB LENSES AT TOP; SOME COAL; SOME MDST IS INTERLAMINATED; FOSSIL PLANTS
Reported Environment: DELTAIC (PARLY FLUVIAL PARTLY PALUDAL - PROUZA, 1977)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	562	-406	(1
COAL	574	-418	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -466 * Thickness:)21
Geologic Description: GREY ARENITE WITH MINOR SLTST AND COAL; CARB LENSES AND RIPPLES NEAR TOP
Reported Environment: DELTAIC. (PARTLY FLUVIAL PARTLY PALUDAL - PROUZA, 1977). (LACUSTRINE, JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	602	-446	(1
COAL	605	-449	(1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -466 * Thickness:)61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS RANGAL CM AND BURNGROVE FM

CONTROL POINT: DENISON NS 34

REFERENCE # B97

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-15	23 48'34"S	147 59'03"E	245	246	11	235	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL COAL DRILLING, SOUTHWEST BOWEN BASIN LEXTON-VANDYKE AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/35 Page FIG 4 Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:Y181
Basal Information: Depth to Base:102 Base Elevation: +143 Thickness: 101
Geologic Description: BASALT WITH MINOR CLAYSTONE AT TOP AND 70 M DEPTH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SEDIMENTS Age: TERTIARY Interpretation Code:Y102
Basal Information: Depth to Base:145 Base Elevation: +101 Thickness: 43
Geologic Description: MULTICOLOURED CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +11 * Thickness:)90
Geologic Description: CONGLOMERATE. LT-GY, GY, GN-GY, GN. PEBBLES UP TO 3CM, OCCASIONAL BOULDERS. PEBBLES OF CHERT, QUARTZ, VOLCANICS, SEDIMENTARY FRAGMENTS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DENISON NS33/38R/39R

REFERENCE # B82

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-15	23 28'16"S	148 08'46"E	+195	+196	-397	593	

REFERENCE: WALLIN, C.I.
DEPARTMENTAL DRILLING. EMERALD-SPRINGSURE AREA, SOUTHWEST AND SOUTH CENTRAL BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1979/46 Page Publn Year: 1979

Cross Reference: PROUZA V 1977, GSQ RECORD 1977/27, 8-11 JENSEN A.R. 1975, BMR BULLETIN 154, 138-139

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:486 Base Elevation: -290 Thickness: 315
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -397 # Thickness: >46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -397 # Thickness: >107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:171 Base Elevation: +25 Thickness: 170
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base 486 Base Elevation: -290 Thickness: 315
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RANGAL CM Age: PERMIAN Interpretation Code:Y103

Basal Information: Depth to Base:547 Base Elevation: -351 Thickness: 61
Geologic Description: GREY SILTSTONE, MUDSTONE, AND ARENITE, WITH COAL BANDS; ARENACEOUS AND CARBONACEOUS LENSES; PLANT FOSSILS
Reported Environment: DELTAIC. PARTLY FLUVIAL, PARTLY PALUDAL (PROUZA, 1977)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	489	-293	3
COAL	515	-319	1
GLOSSOPTERIS FOSSILS	525	-329	

Tectonic Structure:
Remarks

STRATIGRAPHY: BURNGROVE FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -397 ± Thickness: >46
Geologic Description: LT GREY ARENITE, SILTSTONE, WITH SOME TUFF AND COAL; CARB IN PARTS; SILTSTONE LENSES; PLANT FOSSILS.
Reported Environment: DELTAIC. PARTLY FLUVIAL, PARTLY PALUDAL (PROUZA, 1977) LACUSTRINE (JENSEN, 1975)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	549	-353	1
COAL	550	-354	<1
TUFF	582	-386	2
COAL INTERVAL	588	-392	2

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -397 ± Thickness: >107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS RANGAL CM AND BURNGROVE FM.

CONTROL POINT: EM 134

REFERENCE # B69 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-15	23 15'41"S	147 57'56"E	+195	+195	+185	10	8Z

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 30-33;PL 1 Publn Year: 1964

Cross Reference: DICKINS AND MALONE 1973 BMR BULLETIN 130, 45, PLATE 1

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +185 * Thickness: >10
Geologic Description: PEBBLY QZ SST AND INTBDD FELD AND MICAC SST. MINOR SLTST CONTAINING NUMEROUS WORM TUBES AND CASTS; UNDULATE BDG, MUDCRACKS AT TOP
Reported Environment: DELTAIC, (PROBABLY PARTLY BRACKISH - DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS S DG.
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +185 * Thickness: >10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED GEBBIE SUB-GROUP

CONTROL POINT: EM 136

REFERENCE # B69 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-15	23 17'10"S	147 50'04"E	+195	+195	+175	20	*

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 30-33;PL 1 Publn Year: 1964
Cross Reference: DICKINS AND MALONE 1973 BMR BULLETIN 130, 45, PLATE 1

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +175 * Thickness:)20
Geologic Description: QZ AND FELD SST (PEBBLY AND GRITTY IN PLACES) INTBDD WITH SHALE AND SLTST; PEBBLY SST IS XBDD
Reported Environment: DELTAIC (PROBABLY PARTLY BRACKISH - DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 10-13 DEGREES
Remarks NO TD CORRECTION FOR DIP. TRUE THICKNESS USED.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +175 * Thickness:)20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED GEBBIE SUB-GROUP

CONTROL POINT: EM 138

REFERENCE # B69 B

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-15	23 19'30"S	147 57'52"E	+260	+260	-97	357	*

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 30-33;PL 1 Publn Year: 1964

Cross Reference: DICKINS AND MALONE 1973 BMR BULLETIN 130, 45, PLATE 1

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Yi01
Basal Information: Depth to Base:TD Base Elevation: -97 * Thickness:)357
Geologic Description: INTBDD SST (COMMONLY XBDD), MICAC AND CARB SILTSTONE AND SHALE. RARE PLANT REMAINS
Reported Environment: DELTAIC, (PROBABLY PARTLY BRACKISH - DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 8-15 DEGREES
Remarks NO TD CORRECTION FOR DIP. TRUE THICKNESS GIVEN

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Yi02
Basal Information: Depth to Base:TD Base Elevation: -97 * Thickness:)357
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED GEBBIE SUB-GROUP.

CONTROL POINT: INDERI 1

REFERENCE # B113Y1
REFERENCE # B113Y2
REFERENCE # B113Y3
REFERENCE # B113Y4
REFERENCE # B113X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FREMEY OIL	RDH, WIRELINE	SG/55-3	24 17'00"S	148 29'00"E	+216	+219	-1437	1656	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
AFO INDERI NO 1 WELL, QUEENSLAND WELL COMPLETION REPORT
REPORT NO Q/55-56P/130 (UNPUBL)
Page Publn Year: 1963
Cross Reference: BMR PETROLEUM SEARCH SUBSIDY ACTS PUB.7OMOLLAN(ET AL) 1969 BMR REPT 123

REFERENCE: Y2
MOLLAN, R.G., DICKINS, J.M., EXON, N.F.,AND KIRKEGAARD, A.G.
GEOLOGY OF THE SPRINGSURE 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA REPORT 123 Page PLATE 8A Publn Year: 1969
Cross Reference:

REFERENCE: Y3
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130 Page Publn Year: 1973
Cross Reference:

REFERENCE: Y4
ARMAN, M.
PETROGRAPHY AND LITHOLOGICAL CORRELATION OF PERMIAN FORMATIONS IN A.F.O.INDERI NO. 1 AND A.F.O. COORDORAH NO. 1, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, RECORD 1965/226 Page Publn Year: 1965
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base: 283 Base Elevation: -64 Thickness:)253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X115
Basal Information: Depth to Base:283 Base Elevation: -64 Thickness:)253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base: 582 Base Elevation: -363 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1384 Base Elevation: -1165 Thickness: 802
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 385+
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X145
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 385+
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base: TD Base Elevation: -1437+ Thickness: >19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:18 Base Elevation: +201 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: VOLCANICS Age: TERTIARY Interpretation Code:Y102
Basal Information: Depth to Base:28 Base Elevation: +191 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:284 Base Elevation: -65 Thickness: 256

Geologic Description: SILTSTONE AND SHALE (SANDY IN PLACES), GY MICAC CALC SST AT BASE OF [illegible], SST CARBONACEOUS WITH NUMEROUS PLANT FOSSILS
Reported Environment: PALUDAL AND FLUVIAL (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	143	+76	2
COAL	164	+55	4
COAL INTERVAL	198	+21	13
COAL INTERVAL	240	-45	21

Tectonic Structure:
Remarks: P3D OR P4 SPORES IDENTIFIED

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:284 Base Elevation: -65 Thickness: 256
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:357 Base Elevation: -138 Thickness: 73
Geologic Description: INTBDD SILTSTONE AND SHALE GRADING TO SANDSTONE AT BASE; CARBONACEOUS
Reported Environment: SLOW DEPOSITION IN PROTECTED PARALIC BASINS; TRANSITIONAL FROM MARINE TO FRESHWATER (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: P3D OR P4 SPORES IDENTIFIED

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:509 Base Elevation: -290 Thickness: 152
Geologic Description: DK GREY ARG SLTST AND SH WITH THIN CALCAREOUS SST AT TOP AND MIDDLE; PLANT FOSSILS AND POORLY PRESERVED PYRITIZED SHELLS
Reported Environment: DEPOSITION IN EXTENSIVE SHALLOW BASIN VARYING FROM NORMAL MARINE TO RESTRICTED BRACKISH WATER (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
P3B SPORES	407	-188	
P3B SPORES	498	-279	
MANTUAN PRODUCTUS BD	381	-162	24
MARL	488	-269	

Tectonic Structure:
Remarks: EQUIVALENT TO DRY CREEK SHALE IN REFERENCE REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:509 Base Elevation: -290 Thickness: 225
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:514 Base Elevation: -295 Thickness: 5
Geologic Description: MEDIUM-COARSE GRAINED POROUS QUARTZOSE SANDSTONE WITH PATCHY CALC MATRIX
Reported Environment: SHALLOW MARINE AND PARALIC; POSSIBLY POORLY DEVELOPED SAND BARS (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
P3B SPORES	511	-292	

Tectonic Structure:
Remarks: EQUIVALENT TO EARLY STORMS SST IN REFERENCE REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:570 Base Elevation: -351 Thickness: 56
Geologic Description: BLACK CARBONACEOUS SHALE AND COARSE SILTSTONE GRADING TO CALCAREOUS SST; RARE, POORLY PRESERVED MARINE FOSSILS
Reported Environment: RAPID DEPOSITION IN RESTRICTED MARINE CONDITIONS (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1165 Base Elevation: -946 Thickness: 595
Geologic Description: CLEAN WELL SORTED SST WITH ABUNDANT PLANT FOSSILS AND ROOTLETS; TWENTY-TWO COAL SEAMS 2-3 M THICK WITH ASSOCIATED CARB, PYRITIC SHALE
Reported Environment: BRACKISH DELTAIC SEDIMENTATION; PROGRADATION OF DELTAIC SANDS ALTERNATED WITH SLOW SILTY DEPOSITION (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL; 4 SMS	651	-432	19
COAL INTERVAL; 3 SMS	678	-459	14
COAL	838	-619	3
COAL INTERVAL; 4 SMS	983	-764	14

Tectonic Structure:
Remarks P3B SPORES TO -360. P3A SPORES TO -750. SEVERAL OTHER COAL SEAMS PRESENT EQUIVALENT TO ALDEBARAN + FREITAG

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1165 Base Elevation: -946 Thickness: 656
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1437± Thickness: >486±
Geologic Description: UPPER IMPURE SST, SLTST, SH, LST AND MARL; MIDDLE BLK PY SH; LOWER (STANLEIGH) CGL AND PY SH; ABND MARINE FOSSILS, CHARACTERISTIC ASSEMBLAGE
Reported Environment: RAPID DEPOSITION IN SHALLOW MARINE RESTRICTED BASINS (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
SANDSTONE	1343	-1124	16
SANDSTONE	1393	-1174	15
SANDSTONE	1465	-1246	9
P2 SPORES	1599	-1380	308

Tectonic Structure: DIPS 15-30 DG DUE TO BLOCK FAULTING
Remarks BASAL 20 M RECORDED AS STANLEIGH FM IS FLAT-LYING. THICKNESS CORRECTED FOR 22 DG DIP

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -1437± Thickness: >486
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:TD Base Elevation: -1437± Thickness: >1367
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GPS AS ABOVE

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y201
Basal Information: Depth to Base:27 Base Elevation: +192 Thickness: 24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:64 Base Elevation: +155 Thickness: 37
Geologic Description:
Reported Environment: PALUDAL AND FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:125 Base Elevation: +94 Thickness: 61
Geologic Description:
Reported Environment: SLOW DEPOSITION IN PROTECTED PARALIC BASINS, TRANSITIONAL FROM MARINE TO FRESH-WATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:507 Base Elevation: -288 Thickness: 382
Geologic Description:
Reported Environment: DEPOSITION IN EXTENSIVE SHALLOW BASINS VARYING FROM NORMAL MARINE TO RESTRICTED BRACKISH WATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:507 Base Elevation: -288 Thickness: 443
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:512 Base Elevation: -293 Thickness: 5
Geologic Description:
Reported Environment: SHALLOW MARINE AND PARALIC; POSSIBLY POORLY DEVELOPED SAND BARS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:570 Base Elevation: -351 Thickness: 58
Geologic Description:

Reported Environment: RAPID DEPOSITION IN RESTRICED MARINE CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1222 Base Elevation: -1003 Thickness: 652
Geologic Description:
Reported Environment: BRACKISH DELTAIC SEDIMENTATION; PROGRADATION OF DELTAIC SANDS ALTERNATED WITH SLOW SILTY DEPOSITION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO ALDEBARAN + FREITAG

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1222 Base Elevation: -1003 Thickness: 715
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 385
Geologic Description:
Reported Environment: RAPID DEPOSITION IN SHALLOW MARINE RESTRICTED BASINS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 15-30 DG (COMPLETION REPORT)
Remarks THICKNESS CORRECTED FOR 22 DG DIP

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 385
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 1543
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -1437? Thickness: ?19
Geologic Description:
Reported Environment: FRESHWATER SWAMPS IN RAPIDLY SUBSIDING DENISON TROUGH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y381
Basal Information: Depth to Base:30 Base Elevation: +189 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y382
Basal Information: Depth to Base:58 Base Elevation: +161 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y383
Basal Information: Depth to Base:88 Base Elevation: +131 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y384
Basal Information: Depth to Base:283 Base Elevation: -64 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks "GERMAN CREEK CM" IS EQUIVALENT TO MACMILLAN FM + GERMAN CREEK FM + CROCKER FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y387
Basal Information: Depth to Base:515 Base Elevation: -296 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y388
Basal Information: Depth to Base:576 Base Elevation: -357 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y389
Basal Information: Depth to Base:1222 Base Elevation: -1003 Thickness: 646
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks EQUIVALENT TO ALDEBARAN + FREITAG

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:1222 Base Elevation: -1003 Thickness: 713
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 385†
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 15-30 DG (COMPLETION REPORT)
Remarks THICKNESS CORRECTED FOR 22 DG DIP

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 385
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: PACK CREEK GP Age: PERMIAN Interpretation Code:Y313
Basal Information: Depth to Base:1637 Base Elevation: -1418 Thickness: 1579
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y314
Basal Information: Depth to Base:TD Base Elevation: -1437? Thickness: >19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y401
Basal Information: Depth to Base:283 Base Elevation: -64 Thickness: 253
Geologic Description: SLTST AND SST WITH COAL SMS IN LOWER PART. SST IS F-M, FAIR-WELL SRTD, WITH 45% QZ, 10% FLD, 30% KAOL + ILL, SOME CALC AND SID CMT, ROCK FRAGS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y402
Basal Information: Depth to Base:344 Base Elevation: -125 Thickness: 61
Geologic Description: DK GY MDST WITH MINOR SLTST AND SST INTERBEDS. SST IS FINE, WELL SRTD, 40% QZ, 15% FLD, 30% KAOL, 15% SIDERITE CEMENT

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y403
Basal Information: Depth to Base:509 Base Elevation: -290 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y403
Basal Information: Depth to Base:509 Base Elevation: -290 Thickness: 165
Geologic Description: DK GY SILTY FOSSILIF SH WITH SOME INTBDS OF ARG CALC SST. SST IS FINE, WELL SRTD, 35-70% QZ, 0-10% FLD, 10-15% CLAY, 15+% CALC CEMENT
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y404
Basal Information: Depth to Base:509 Base Elevation: -290 Thickness: 451
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH, GERMAN CREEK CM AND PEAWADDY FM

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y404
Basal Information: Depth to Base:509 Base Elevation: -290 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y405
Basal Information: Depth to Base:514 Base Elevation: -295 Thickness: 5
Geologic Description: CREAM AND LT GY SST CONTAINING 50-65% QZ, 10-15% FLD, 10% KAOL, SOME CARB MATERIAL AND PYRITE. SST F-M, MODERATELY SRTD
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y406
Basal Information: Depth to Base:570 Base Elevation: -351 Thickness: 56
Geologic Description: BLK MICAC CARB SH AND SLTST WITH SOME SST INTBDS. SST IS M-C, POORLY SRTD, 55% QZ, 0-10% FLD, 15% KAOL, 10% MICAC MATRIX, 5% CARB MATERIAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ACCESSORY MINERALS INCLUDE ZIRCON, TOURMALINE AND PYRITE

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y407
Basal Information: Depth to Base:838 Base Elevation: -619 Thickness: 268
Geologic Description: LT SST WITH LESSER CARB SH AND SLTST. SST IS M-C, MOD SRTD, 60-90% QZ, 5% FLD, 5% CHERT, 10% CLAY. MINOR CALC AND CARB MATTER. QZ OVERGROWTHS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO ALDEBARAN + FREITAG

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y408
Basal Information: Depth to Base:838 Base Elevation: -619 Thickness: 329
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y409
Basal Information: Depth to Base:TD Base Elevation: -1437# Thickness: >618
Geologic Description: GY SST WITH SOME INTERCALATIONS OF DK SLTST, COAL, CGL IN TOP. DK SH AND SLTST WITH SOME SST INTERCALATIONS IN BOTTOM
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
STAIRCASE SST MB 1167 -948 329
STANLEIGH SH MB TD >489
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y410
Basal Information: Depth to Base:TD Base Elevation: -1437# Thickness: >618
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: LACK CREEK GP Age: PERMIAN Interpretation Code:Y411
Basal Information: Depth to Base:TD Base Elevation: -1437# Thickness: >1373
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

CONTROL POINT: MORELLA 1

REFERENCE # B132Y1
REFERENCE # B132Y2
REFERENCE # B133X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
SHELL QLD DEV CO	RDH	SG/55-8	25 01'00"S	148 29'30"E	+291	+294	-1118	1412	?

REFERENCE: X1
THIS REPORT
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DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130
Page 115 Publn Year: 1973
Cross Reference:

REFERENCE: Y2
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL VOL. 81, NO.940
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:274 Base Elevation: +20 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:430 Base Elevation: -136 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:430 Base Elevation: -136 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:830 Base Elevation: -536 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1128 Base Elevation: -834 Thickness: 298
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1329 Base Elevation: -1035 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X155
Basal Information: Depth to Base:1329 Base Elevation: -1035 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:TD Base Elevation: -1118# Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:274 Base Elevation: +20 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:430 Base Elevation: -136 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:573 Base Elevation: -279 Thickness: 143
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:823 Base Elevation: -529 Thickness: 250
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:823 Base Elevation: -529 Thickness: 393
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1178 Base Elevation: -884 Thickness: 355
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1178 Base Elevation: -884 Thickness: 355
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1329 Base Elevation: -1035 Thickness: 1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1329 Base Elevation: -1035 Thickness: 151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1329 Base Elevation: -1035 Thickness: 899

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH, PEAWADDY FM, ALDEBARAN SST, AND CATTLE CREEK FM

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -1118* Thickness: >84
Geologic Description: ANDESITES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
VOLCANICS
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:708 Base Elevation: -414 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks STRATIGRAPHY ABOVE PEAWADDY FM NOT GIVEN IN REFERENCE ALTHOUGH PRESENCE OF BLACK ALLEY AND BANDANNA ARE IMPLIED IN FIG 4

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:708 Base Elevation: -414 Thickness: >141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PEAWADDY FM. STRATIGRAPHY ABOVE PEAWADDY NOT GIVEN

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:808 Base Elevation: -514 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:830 Base Elevation: -536 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1128 Base Elevation: -834 Thickness: 298
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1128 Base Elevation: -834 Thickness: 428
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS INGELARA, FREITAG, ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1330 Base Elevation: -1036 Thickness: 202
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1330 Base Elevation: -1036 Thickness: 202
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1330 Base Elevation: -1036 Thickness:)763
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks STRATIGRAPHY ABOVE PEAWADDY FM NOT GIVEN IN REFERENCE. ALSO CONTAINS INGELARA, FREITAG, ALDEBARAN, CATTLE CREEK, BASEMNT

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y210
Basal Information: Depth to Base:TD Base Elevation: -1118# Thickness:)82
Geologic Description: ANDESITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MAY OR MAY NOT BE REIDS DOME BEDS (P115)

CONTROL POINT: NOGOA RIVER EM 6-8

REFERENCE # 884

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	SECTION	SF/55-15	23 39'30"S	148 02'00"E	CA+235	CA+235	CA-305	CA 540	

REFERENCE: VEEVERS, J.J., MOLLAN, R.G., OLGERS, F., AND KIRKEGAARD, A.G.
GEOLOGY OF THE EMERALD 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO. 68 Page 30-38;PL 1 Publn Year: 1964
Cross Reference: DICKINS J.M. AND MALONE E.J., 1973, BMR BULLETIN 130, P45

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code X
Basal Information: Depth to Base:441 Base Elevation: - 206 Thickness: >400t
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 235 M AT SURFACE. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:441 Base Elevation: -206 Thickness: 400
Geologic Description: WHITE PEBBLY SST
Reported Environment: DELTAIC, PARTLY BRACKISH (DICKINS AND MALONE, 1973)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 7 DG WSW TO 25 DG NNE
Remarks ALDEBARAN TAKEN AS THAT UNIT ABOVE THE FOSSIL BDS. DEPTH TO BASE DERIVED USING APPARENT THICKNESS OF UNITS

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:441 Base Elevation: -206 Thickness: 400
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -305 # Thickness: >90
Geologic Description: M-C WHITE QZ SST AND PEBBLY QZ SST WITH SOME SLTST. PELECYPODS BRACHIOPODS FORAMINIFERA
Reported Environment: MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BIVALVES	442	-287	
BIVALVES,BRACH,FORAM	540	-305	

Tectonic Structure: DIPS 7 DG WSW TO 25 DG NNE
Remarks OUTCROPS ON BANKS OF NOGOA RIVER, 12 MILES SW OF EMERALD; CORRELATED WITH CATTLE CREEK FM BY PALEONTOLOGY.

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -305 # Thickness: >90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Yi05
Basal Information: Depth to Base:TD Base Elevation: -305 # Thickness:)490
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST OF GEBBIE SUB-GROUP AND CATTLE CREEK FM OF TIVERTON SUB-GROUP

CONTROL POINT: PURBROOK 1

REFERENCE # B122Y1
REFERENCE # B122Y2
REFERENCE # B122Y3
REFERENCE # B122X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH, CORE + WIRELINE	SG/55-4	24 37'10"S	148 48'20"E	+239	+242	-1266	1508	?

REFERENCE: X1
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Cross Reference:

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QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:164 Base Elevation: +78 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:454 Base Elevation: -212 Thickness: 290
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING =

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:454 Base Elevation: -212 Thickness: 290
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X130

Basal Information: Depth to Base:829? Base Elevation: -587? Thickness: 15?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:960 Base Elevation: -718 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1036 Base Elevation: -794 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -718 M. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:164 Base Elevation: +78 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:335 Base Elevation: -93 Thickness: 171
Geologic Description: WHITE TO GREY-GREEN SLTST, SH, AND SST. ARG SECTIONS CONTAIN NUM THIN COAL SMS AND PLANT FOSSILS. UNITS ARE CALC AND IN PART CARB.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 10 SMS (< 3 M) 312 -70 93
Tectonic Structure:
Remarks REPRESENTS UPPER BANDANNA IN WELL REPORT. BOTTOM PICKED AT BREAK IN ELECTRIC LOG BELOW COAL INTERVAL

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:335 Base Elevation: -93 Thickness: 171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:456 Base Elevation: -214 Thickness: 121
Geologic Description: LT TO DK GREY CARB SLTST AND SH, MIDDLE IS ARENACEOUS WITH GY TO GN SST. CALCAREOUS AND CONTAINS PLANT REMAINS.
Reported Environment: LAGOONAL-RESTRICTED BAY SHALE FACIES (JACKSON, ET AL. 1980)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks REPRESENTS LOWER BANDANNA IN WELL REPORT. CARB SST AT 426 M DEPTH WITH VTRE 0.76 (JACKSON, ET AL, 1980)

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:565 Base Elevation: -323 Thickness: 109
Geologic Description: LT TO DK GREY AND LT BROWN SH WITH MINOR SST. VERY CARBONACEOUS AND CALCAREOUS. PLANT REMAINS THROUGHOUT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS DRY CREEK SH IN REFERENCE REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:565 Base Elevation: -323 Thickness: 230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:622 Base Elevation: -380 Thickness: 57
Geologic Description: INTBDD SLTST, SH, SST. SLTS AND SH ARE LT TO DK GREY OR BLACK, CARB, AND IN PART PY AND CALC. SST IS LT GREY AND ARG. MARINE FOSS, PLANT FRAG.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS EARLY STORMS SST IN WELL REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:926 Base Elevation: -684 Thickness: 304
Geologic Description: INTBDD LT GREY TO BLACK,V CARB, PY, CALC SHALE; BUFF SH; CREAM BENTONITIC SH; THIN SLTST. COALY INTERVALS AND PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY BEDS	829	-587	15
P3B SPORES	860	-618	

Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1166 Base Elevation: -924 Thickness: 240
Geologic Description: F-M, HARD SST IN UPPER UNIT. LOWER PART MOSTLY DK GY SH AND CREAM BENTONITIC (CAVING?) SH. MINOR CGL SST AT TOP AND BASE. CARB, PY, PLANT FOSS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
P3A OR P2 SPORES	1164	-922	

Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1166 Base Elevation: -924 Thickness: 601
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA SH, ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1450 Base Elevation: -1208 Thickness: 284
Geologic Description: LT TO DK GREY AND BROWN SH, V CARB PY CALC. SOME CREAM TO OLIVE GN BENTONITIC (CAVING?) SH AND MINOR SLTST. PLANT FOSS, XLLINE CALCITE
Reported Environment: SHALLOW SHELF MDST-SH FACIES (JACKSON,ET AL, 1980)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PZ SPORES	1316	-1074	

Tectonic Structure:
Remarks: CARB SH AT 1315.5 M DEPTH WITH VTRF OF 1.69 (JACKSON, ET AL, 1980)

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1450 Base Elevation: -1208 Thickness: 284
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1450 Base Elevation: -1208 Thickness: 1115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y114
Basal Information: Depth to Base:TD Base Elevation: -1266# Thickness: >531
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 10-4 DG
Remarks: UPPER DEVONIAN LEPTOPHLOEUM AUSTRALE PLANT FOSSILS. THICKNESS CORRECTED FOR 25 DG DIP.

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:TD Base Elevation: -1266# Thickness: >57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:204 Base Elevation: +38 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:454 Base Elevation: -212 Thickness: 250
Geologic Description: INTBDD SH, SLTST, AND SST WITH THIN COALS IN UPPER UNIT. LITHOLOGIES ARE CALC AND CONTAIN PLANT FOSS AND ARE CARB IN LOWER PART
Reported Environment: PALUDAL AND FLUVIAL. COAL SEQ DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS (DICKINS AND MALONE, 1973)
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
COAL, 10 SMS (< 3 M) 172 -70 93
Tectonic Structure:
Remarks EQUIV TO BANDANNA AND BLACK ALLEY OF WELL REPORT (Y1). CARB SST AT 426 MDEPTH WITH VTRF 0.76 (JACKSON, ET AL, 1980)

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:559 Base Elevation: -317 Thickness: 105
Geologic Description: LT TO DK GREY AND LT BROWN SHALE WITH MINOR SST. V CARB AND CALC. PLANT REMAINS THROUGHOUT
Reported Environment: SLOW DEPOSITION IN RESTRICTED PARALIC BASINS WITH PERIODS OF EMERGENCE (MOLLAN, 1969). DEPOSITION IN RESTRICTED,COLD STAGNANT WATER,DICKINS,1973
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO PEAWADDY IN WELL REPORT (Y1)

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:925 Base Elevation: -683 Thickness: 366
Geologic Description: LT GY TO BLK SLYST AND SH WITH SST AND MARINE FOSS AT TOP. LOWER PART MORE CARB AND PY AND HAS COALY INTERVALS. PLANT FOSSILS THROUGHOUT
Reported Environment: DEPOSITION IN EXTENSIVE SHALLOW BASIN VARYING FROM NORMAL MARINE TO RESTRICTED BRACKISH WATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COALY BEDS 829 -587 15
P3B SPORES 860 -618
Tectonic Structure:
Remarks EQUIVALENT TO CATHERINE SST AND INGELARA SH IN WELL INTERPRETATION (Y1)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:925 Base Elevation: -683 Thickness: 471
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1036 Base Elevation: -794 Thickness: 111
Geologic Description: GREY AND LT BROWN F-M GRAINED, HARD, WELL CEMENTED SST, PY AND CALC.
Reported Environment: BRACKISH DELTAIC SEDIMENTATION. PROGRADATION OF DELTAIC SANDS ALTERNATED WITH SLOW SILTY DEPOSITION.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO UPPER 111 M OF ALDEBARAN SST IN COMPLETION REPT INTERPRETATION (Y1)

STRATIGRAPHY: DEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1036 Base Elevation: -794 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1448 Base Elevation: -1206 Thickness: 412
Geologic Description: LT TO DK GREY AND BROWN SH, IN PART BENTONITE (CAVING?), PY, CALC, V CARBONACEOUS, PLANT FOSSILS.
Reported Environment: RAPID DEPOSITION IN SHALLOW MARINE RESTRICTED BASINS (MOLLAN, 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
P3A OR P2 SPORES 1164 -922
P2 SPORES 1316 -1074

Tectonic Structure:
Remarks EQUIVALENT TO LOWER 130 M OF ALDEBARAN AND CATTLE CK IN WELL INTERPRETATION. CARB SH, 1315.5 M DEPTH WITH VTRF 1.69 (JAC

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1448 Base Elevation: -1206 Thickness: 412
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1448 Base Elevation: -1206 Thickness: 994
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLACK ALLEY SH, PEAWADDY FM OF BLENHEIM SUB-GR; ALDEBARAN SST OF GEBBIE SUB-GROUP; CATTLE CREEK FM OF TIVERTON SUB-GROUP

STRATIGRAPHY: YIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -1266# Thickness:)54†
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 10-40 DG (WELL REPT)
Remarks THICKNESS CORRECTED FOR 25 DG DIP

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:165 Base Elevation: +77 Thickness: 162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:366 Base Elevation: -124 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:366 Base Elevation: -124 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:567 Base Elevation: -325 Thickness: 201
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:714 Base Elevation: -472 Thickness: 147
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:714 Base Elevation: -472 Thickness: 348
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH & PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:927 Base Elevation: -685 Thickness: 213
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:960 Base Elevation: -718 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:1036 Base Elevation: -794 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERBIE SUB-GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:1036 Base Elevation: -794 Thickness: 322
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS INGELARA FM, FREITAG FM & ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:1451 Base Elevation: -1209 Thickness: 415
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:1451 Base Elevation: -1209 Thickness: 415
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y313
Basal Information: Depth to Base:1451 Base Elevation: -1209 Thickness: 1085
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE & TIVERTON SUB-GROUPS

CONTROL POINT: PURBROOK SOUTH 1

REFERENCE # B129Y1
REFERENCE # B129Y2
REFERENCE # B129X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMAL. PET. EXPL.	RDH, CORE + WIRELINE	SG/55-4	24 49'30"S	148 46'40"E	+249	+253	-1448	1701	?

REFERENCE: X1 THIS REPORT Page Publn Year:

Cross Reference:

REFERENCE: Y1 DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130 Page 115; TBL 5 Publn Year: 1973
Cross Reference: JACKSON, K.S., ET AL., 1980, APEA JOURNAL VOL 20 (1), P143-158

REFERENCE: Y2 GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH.
QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 81, NO.940 Page 110-130 Publn Year: 1980
Cross Reference: JACKSON, K.S., ET AL., 1980, APEA JOURNAL VOL 20 (1), P143-158

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:680 Base Elevation: -427 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:920 Base Elevation: -667 Thickness: 240
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:920 Base Elevation: -667 Thickness: 240
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1408 Base Elevation: -1155 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y140
Basal Information: Depth to Base:1483 Base Elevation: -1230 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y181
Basal Information: Depth to Base:671 Base Elevation: -418 Thickness: 567
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:920 Base Elevation: -667 Thickness: 249
Geologic Description:
Reported Environment: TERRESTRIAL; FLUVIAL, LACUSTRINE, AND PALUDAL DEPOSITION. UPPER COAL-BEARING PART DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1009 Base Elevation: -756 Thickness: 89
Geologic Description:
Reported Environment: MARINE - PARALIC ENVIRONMENT. COLD BRACKISH WATER WITH EUXINIC CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1359 Base Elevation: -1106 Thickness: 350
Geologic Description:
Reported Environment: TRANSGRESSIVE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1359 Base Elevation: -1106 Thickness: 439
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1483 Base Elevation: -1230 Thickness: 124
Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1483 Base Elevation: -1230 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1448* Thickness: >218
Geologic Description:
Reported Environment: DOMINANTLY MARINE WITH PARALIC BRACKISH TO FRESH WATER ENVIRONMENTS AROUND THE MARGINS OF THE BASIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CARB SST AT 1699.6 M DEPTH WITH VTRF OF 0.97. SHALLOW SHELF MDST AND SHALE FACIES (JACKSON, ET AL., 1980)

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1448* Thickness: >218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1448* Thickness: >781
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:680 Base Elevation: -427 Thickness: 676
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:873 Base Elevation: -620 Thickness: 193
Geologic Description:
Reported Environment: WIDESPREAD PALUDAL AND LACUSTRINE CONDITIONS THROUGHOUT THE BOWEN AND GALILEE BASINS DURING A MAJOR LATE PERMIAN REGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:873 Base Elevation: -620 Thickness: 193

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:1609 Base Elevation: -756 Thickness: 136
Geologic Description:
Reported Environment: GRADATIONAL FROM MARINE TO FRESHWATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1211 Base Elevation: -958 Thickness: 202
Geologic Description:
Reported Environment: SHALLOW MARINE. SOME DELTAIC OR FLUVIAL SEDIMENTATION IN THE NORTH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1211 Base Elevation: -958 Thickness: 338
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1359 Base Elevation: -1106 Thickness: 148
Geologic Description:
Reported Environment: SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1408 Base Elevation: -1155 Thickness: 49
Geologic Description:
Reported Environment: TRANSGRESSIVE MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1483 Base Elevation: -1230 Thickness: 75
Geologic Description:
Reported Environment: REGRESSIVE SEQUENCE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1483 Base Elevation: -1230 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM, FREITAG FM, AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -1448$ Thickness:)218
Geologic Description:
Reported Environment: MARINE TRANSGRESSIVE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -1448$ Thickness:)218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -1448$ Thickness:)828
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE, AND TIVERTON SUB-GROUPS AS ABOVE

CONTROL POINT: REIDS DOME 1

REFERENCE # B128

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL EXPL.	RCH, CORE + WIRELINE	SG/55-3	24 47'25"S	148 19'18"E	+293	+296	-2465	2761	

REFERENCE: MILES, K.R.
AUSTRALIAN OIL EXPLORATION LIMITED REPORT ON A.O.E NO. 1 WELL REIDS DOME
UNPUBLISHED COMPLETION REPORT
Page Publn Year: 1955

Cross Reference: MOLLAN,R.G., ET AL.,1969. BMR REPT. 123.
, BMR BULLETIN 130, TABLE 5

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:21 Base Elevation: +275 Thickness:)18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 293 M(AT SURFACE) VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -2465$ Thickness:)2244
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:21 Base Elevation: +275 Thickness: 18
Geologic Description: ARENACEOUS LITHOLOGIES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT AT SURFACE AT WELL LOCATION ON SPRINGSURE SHEET AND NOT PRESENT IN OTHER WELL INTERPS. (DICKINS AND MALONE 1973)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base-21 Base Elevation: +275 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALDEBARAN SANDSTONE

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:517 Base Elevation: -221 Thickness: 496
Geologic Description: DOMINANTLY ARGILLACEOUS WITH SST OR SANDY INTERVALS AND THIN LST BEDS. DK CARBONACEOUS SH; MARINE FOSSILS, PLANT FOSSILS AT BASE
Reported Environment: RAPID DEPOSITION IN RESTRICTED MARINE BASINS (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
SANDSTONE	101	+195	12
SANDSTONE	149	+147	8
LIMESTONE	256	+40	1

Tectonic Structure:

Remarks: AT SURFACE AT WELL LOCATION ON SPRINGSURE SHEET AND INTERPRETED AS TOP UNIT BY DICKINS AND MALONE (1973)

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y184
Basal Information: Depth to Base:517 Base Elevation: -221 Thickness: 496
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:517 Base Elevation: -221 Thickness: 514
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS ALDEBARAN SS (GEBBIE SUB-GR) AND CATTLE CREEK FM (TIVERTON SUB-GR)

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -2465? Thickness:)2245
Geologic Description: THIN INTBDD CARB SST AND COALY ANDHYDRITE SHALES. NUMEROUS DIRTY COAL BES (1 M THIC. ABUNDANT PLANT FOSSILS ESP. GLOSSOPTERIS FLORA
Reported Environment: RAPID DEPOSITION IN SEMI-LAGOONAL SWAMP (COMPLETION REPORT). FRESH-WATER SWAMPS IN RAPIDLY SUBSIDING DENISON TROUGH (MOLLAN ET AL., 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
GREEN MICRODIORITE 2446 -2150 1
GRAPHITIC SH/QZ VEIN 2693 -2397 5
Tectonic Structure:
Remarks: TOP 91 M CONTAINS ESTUARINE FOSSIL ASSEMBLAGE; TRANSITION FROM FRESH WATER TO MARINE

CONTROL POINT: ROLLESTON 1

REFERENCE # B121Y1
REFERENCE # B121Y2
REFERENCE # B121Y3
REFERENCE # B121X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH, CORE + WIRELINE	SG/55-4	24 33'47"S	148 37'52"E	+208	+212	-2686	2898	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.F.O. ROLLESTON NO. 1 WELL, QUEENSLAND. WELL COMPLETION REPORT.
UNPUBLISHED COMPANY REPORT NO. Q/55-56P/159 (BMR FILE NO. 63/1036)
Page Publn Year: 1964
Cross Reference:

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130
Page 115; TBL 5 Publn Year: 1973
Cross Reference:

REFERENCE: Y3
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:213 Base Elevation: -1 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:423 Base Elevation: -212 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:423 Base Elevation: -212 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:585 Base Elevation: -373 Thickness:

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:956 Base Elevation: -744 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1402 Base Elevation: -1190 Thickness: 446
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:2173 Base Elevation: -1961 Thickness: 771
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X165
Basal Information: Depth to Base:2173 Base Elevation: -1961 Thickness: 771
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X170
Basal Information: Depth to Base:TD Base Elevation: -2686# Thickness:)725
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:24 Base Elevation: +187 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:423 Base Elevation: -212 Thickness: 399
Geologic Description: INTERBEDDED GREYWACKE SANDSTONE, SILTSTONE, SHALE, AND COAL. SEQUENCE IS CHARACTERISTICALLY CARBONACEOUS. PLANT REMAINS IN THE SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO UPPER BANDANNA IN COMPLETION REPORT. COAL, 9 SEAMS 1-3 M THICK AT -108 (107) 320 M DEPTH

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:423 Base Elevation: -212 Thickness: 399
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:564 Base Elevation: -352 Thickness: 141
Geologic Description: DK GY-BLK CARB SH WITH CHARACTERISTIC WHITISH, WAXY TUFFS. MINOR BN XLLINE LST AND DOL. GWKE SST AND COAL AT BASE. PLANT REMAINS, SKELETAL FRAG
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE + DOLOMITE	507	-295	5
COAL	564	-352	2

Tectonic Structure:
Remarks EQUIV TO LOWER BANDANNA IN COMPLETION REPORT. TUFFS THROUGHOUT

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:897 Base Elevation: -684 Thickness: 333
Geologic Description: DK GY CARB SH WITH THIN INTBDS OF SLTST. CALC SST AT TOP. LST AND MARL OCCUR IN MIDDLE. LOWER PART MOSTLY CARB SH. MARINE AND PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	586	-374	21
LIMESTONE + MARL	724	-512	3

Tectonic Structure:
Remarks EQUIV TO MANTUAN BD + DRY CREEK SH OF COMPLETION REPORT. MANTUAN PRODUCTUS BD CORRELATED BY WIRELINE SIGNATURE

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:897 Base Elevation: -684 Thickness: 474
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:918 Base Elevation: -707 Thickness: 21
Geologic Description: UPPER PART F-C GR, POORLY SRTD, CLEAN QZ SST. LOWER PART F GR, MICAC, ARGILLACEOUS, QZ SST WITH PATCHY PYRITIC CEMENT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO EARLY S[illegible]RMS SST OF COMPLETION REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y108

Basal Information: Depth to Base:952 Base Elevation: -740 Thickness: 34
Geologic Description: CARB, ARG SEQUENCE. DK GY, CARB, SILTY SH WITH MINOR MARL AND THIN INTBDS OF SLTST. GENERALLY PYRITIC AND MICAC. CONTAINS PYRITIZED PLANT FRAGS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1401 Base Elevation: -1190 Thickness: 449
Geologic Description: QZ, QZ-LI, AND QZ-LAB SST WITH INTBDS OF CARB-COALY SLTST AND PY SH. RARE COAL STRINGERS. CURRENT BDD. ROOTLETS, PITH CASTS COMMON. SILIC, CALC
Reported Environment: SHALLOW WATER, DELTAIC-ESTUARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1401 Base Elevation: -1190 Thickness: 504
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -2686# Thickness: >1497
Geologic Description: LARGELY BKL, PY, CARB SH WITH AREN SILTY TOP. INTBDD SST, SLTST, SH, COAL IN MIDDLE BASAL INTBDD CGL, SST, SLTST, SH, COAL. PLANT, MARINE FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 2178 -1986 2
COAL 2271 -2059 32
VOLCANIC ASH 2499 -2287
BRIGHT COAL 2810 -2598 143
Tectonic Structure:
Remarks COMPLETION REPT RECORDS STANLEIGH SH AT -2449 (493) AND ROLLESTON CGL AT TD (>237). DOLOMITE REPORTED IN LOWER BLK SH

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -2686# Thickness: >1497
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -2686# Thickness: >2475
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y201
Basal Information: Depth to Base:23 Base Elevation: +189 Thickness: 20
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:213 Base Elevation: -1 Thickness: 191
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:422 Base Elevation: -210 Thickness: 209
Geologic Description:
Reported Environment: FLUVIAL, PALUDAL, LACUSTRINE. COAL MEASURES DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:564 Base Elevation: -352 Thickness: 142
Geologic Description:
Reported Environment: COLD BRACKISH WATER WITH EUXINIC CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:896 Base Elevation: -684 Thickness: 332
Geologic Description:
Reported Environment: MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:896 Base Elevation: -684 Thickness: 474
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:720 Base Elevation: -708 Thickness: 24
Geologic Description:
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING OF SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:953 Base Elevation: -741 Thickness: 33
Geologic Description:
Reported Environment: RELATIVELY DEEP MARINE WITH EUXINIC CONDITIONS AND LITTLE EFFECTIVE REWORKING OF SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1402 Base Elevation: -1190 Thickness: 449
Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1402 Base Elevation: -1190 Thickness 506
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:2173 Base Elevation: -1961 Thickness: 771
Geologic Description:
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:2173 Base Elevation: -1961 Thickness: 771
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:2173 Base Elevation: -1961 Thickness: 1751
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y214
Basal Information: Depth to Base:TD Base Elevation: -2666? Thickness:)725
Geologic Description: INTERBEDDED VOLCANOLITHIC PEBBLE CONGLOMERATE AND LITHIC FELDSPATHIC SST
Reported Environment: DOMINANTLY NON-MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:201 Base Elevation: +11 Thickness: 197
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:373 Base Elevation: -161 Thickness: 172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:373 Base Elevation: -161 Thickness: 172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:565 Base Elevation: -353 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:718 Base Elevation: -506 Thickness: 153
Geologic Description: COMPRISES 2 SUB-UNITS: LOWER SLTST, SST, SH SUB-UNIT, & UPPER SST & COQUINITE SUB-UNIT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:718 Base Elevation: -506 Thickness: 345
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH & PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:732 Base Elevation: -520 Thickness: 14
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:899 Base Elevation: -687 Thickness: 167
Geologic Description: BASAL PART REPRESENTED BY A LOW RESISTIVITY SHALE OR MUDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:956 Base Elevation: -744 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:1402 Base Elevation: -1190 Thickness: 446
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:1402 Base Elevation: -1190 Thickness: 684
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM, FREITAG FM & ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:2231 Base Elevation: -2019 Thickness: 829
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y313
Basal Information: Depth to Base:2231 Base Elevation: -2019 Thickness: 829
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y314
Basal Information: Depth to Base:2231 Base Elevation: -2019 Thickness: 1858
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE & TIVERTON SUB-GROUPS

STRATIGRAPHY: PEIDS DOME SEDS Age: PERMIAN Interpretation Code:Y31S
Basal Information: Depth to Base:TD Base Elevation: -2686% Thickness:)667
Geologic Description: THICK SEQUENCES OF MUDSTONE/SILTSTONE, IN PART PYRITIC
Reported Environment: DEPOSITED IN WATER DEEPER THAN DELTAIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SPRINGSURE 1-4

REFERENCE # B124

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 39'08"S	148 28'00"E	+239	+239	-782	1021	C

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 77 Page 147-163 Publn Year: 1976
Cross Reference: GRAY, A.R.G , 1980, QMJ VOL.81, P110-163

SEDIMENTARY BASIN: ROMEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:85 Base Elevation: +154 Thickness:)81
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:212 Base Elevation: +27 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:212 Base Elevation: +27 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: 782 Thickness:)243t
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -476 M. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y181
Basal Information: Depth to Base:85 Base Elevation: +154 Thickness: 81
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E.
Remarks THICKNESS CORRECTED FOR 16-18 DG DIP

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y182
Basal Information: Depth to Base:212 Base Elevation: +27 Thickness: 121

Geologic Description: THIN BDD AND LAMD SLTST, SH, AND SST, THIN-THICK BDD SST, AND COAL. CARB AND MICAC SEQ. GLOSSOPTERIS LEAF IMPRESSIONS COMMON.
Reported Environment: WIDESPREAD PALUDAL AND LACUSTRINE CONDITIONS
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, B SMS,(3 M THK	175	+64	90

Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E.
Remarks: THICKNESS CORRECTED FOR 17 DG DIP.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:212 Base Elevation: +27 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, B SMS,(3 M THK	175	+64	90

Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E.
Remarks: THICKNESS CORRECTED FOR 17 DG DIP. CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:372 Base Elevation: -133 Thickness: 153
Geologic Description: THIN BDD AND LAMD, CARB, MICAC SH, SLTST, AND MDST INTBDD WITH GN-GY SILTY BENTONITE AND MINOR SST. BENTONITE IN BDS 0.3-1 M THICK. VERY CALC.
Reported Environment: TRANSITIONAL FROM MARINE PEAWADDY AND PALUDAL BANDANNA
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E.
Remarks: THICKNESS CORRECTED FOR 17 DG DIP.

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:514 Base Elevation: -275 Thickness: 136
Geologic Description: THIN BDD AND LAMD SLTST, SST, AND SH WITH MINOR LST, COQ, AND MDST. AREN IN TOP 35 M. SLTST AND SH ARE CARB AND MICAC. MARINE FOSS THROUGHOUT.
Reported Environment: EXTENSIVE SHALLOW BASIN WITH MARINE CONDITIONS FOR AT LEAST PART OF THE TIME. DELTAIC AND LACUSTRINE TO THE WEST
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	MANTUAN PRODUCTUS BD	374	-134	1-2
	LST FOSSIL CORAL BD	376	-136	0.6

Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E.
Remarks: THICKNESS CORRECTED FOR 17 DG DIP.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:514 Base Elevation: -275 Thickness: 289
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: INCLUDES BLACK ALLEY SH AND PEAWADDY FM.

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:625 Base Elevation: -386 Thickness: 106
Geologic Description: F-M GRAINED, FAIR-WELL SORT SST WITH LESSER SLTST, SANDY SLTST AND SH. MIDDLE SECTION IS SILTY, ARG, AND SIMILAR TO INGELARA SH. MARINE FOSS.
Reported Environment: SHALLOW MARINE AND PARALIC. POSSIBLY IN PART SAND BARS
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E
Remarks: THICKNESS CORRECTED FOR 17 DG DIP

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:715 Base Elevation: -476 Thickness: 86
Geologic Description: LAMD AND POORLY BDD DK SH, SAND SH, SLTST, AND LESSER SANDY SLTST AND FINE SST. LOWER SEQ MORE AREN AND TFAC. CARB UPPER SEQ. MARINE FOSS.
Reported Environment: TRANSGRESSIVE SHALLOW MARINE

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E
Remarks THICKNESS CORRECTED FOR 17 DG DIP

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:767 Base Elevation: -528 Thickness: 50
Geologic Description: THIN BDD AND LAMD DK SANDY SLTST, MUDDY SST, AND SH. MINOR LT GY POOR SORT SST. GLACIAL PBL IN LOWER PART. COQ BD IN MIDDLE
Reported Environment: LOW ENERGY MARINE. GRADUAL RETURN TO MARINE CONDITIONS, TRANSITIONAL BETWEEN ALDEBARAN AND INGELARA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
LST, COQUINITE BED 8.3
Tectonic Structure: CONSUELO ANTICLINE. SURF DIP 16-18 DG E
Remarks SIMILAR TO OVERLYING INGELARA BUT SST IS DIFFERENT AND DISTINCTIVE ELECTRIC LOG. THICKNESS CORRECTED FOR 17 DG DIP.

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -782 ± Thickness: >243
Geologic Description: LT GREY, FINE TO GRANULE, FAIR TO POORLY SORTED, ARG SST. SCATTERED CHERT, VOLC, AND QZ PBL. DIRTY COAL SEAMS <1 M THICK
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SMS, DIRTY COAL <1
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -782 ± Thickness: >485
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES CATHERINE SST, INGELARA SH, FREITAG FM, ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -782 ± Thickness: >774
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES BLENHEIN SUB-GR: BLACK ALLEY SH, PEAWADDY FM; AND GEBBIE SUB-GR: CATHERINE, INGELARA, FREITAG, ALDEBARAN

CONTROL POINT: SPRINGSURE 10

REFERENCE # B116

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 25'00"S	148 18'00"E	+430	+430	-70	5LA	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 77 Page 146-163 Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -70 Thickness:)32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -38 M. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:37 Base Elevation: +393 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:167 Base Elevation: +263 Thickness: 130
Geologic Description: UPPER SUBUNIT OF SANDSTONE AND SILTSTONE. LOWER SUBUNIT OF SILTSTONE AND SHALE.
Reported Environment: SHALLOW BASIN, MORE EXTENSIVE THAN DENISON TROUGH. MARINE FOR AT LEAST PART OF THE TIME. DELTAIC AND LACUSTRINE ENVIRONMENTS TO THE WEST
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:167 Base Elevation: +263 Thickness: 130
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:268 Base Elevation: +162 Thickness: 101
Geologic Description: TOP SUBUNIT (59 M) OF F-M, WELL SORT SST. MIDDLE SUBUNIT (34 M) OF LAMD, SILTY SST, SLTST, SH. BOTTOM SUBUNIT OF F-M WELL SORT SST. MARINE FOSS.
Reported Environment: SHALLOW MARINE AND PARALIC. POSSIBLY PARTLY DEPOSITED AS SAND BARS.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:406 Base Elevation: +24 Thickness: 138

Geologic Description: LAMD AMD POORLY BDD GY-BLK SH, SANDY SH, AND SLTST. UPPER SEQ CONTAINS MARINE FOSS. PY AND CARB AT TOP. LOWER SEQ AREN AND CONTAINS VOLC ANT TF.
Reported Environment: SHALLOW MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
TUFFS IN LOWER SEQ
VOLCANICS, LOWER SEQ
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:468 Base Elevation: -38 Thickness: 62
Geologic Description: UPPER 41 M OF F-C, FAIR-POOR SORT SST WITH CARB PARTINGS AND MINOR SLTST AND SH. LOWER 21 M OF THIN IRREG BDD CARB SLTST AMD SH,SOME SST,BIOTURB
Reported Environment: TRANSITIONAL BETWEEN ALDEBARAN AND INGELARA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -70 * Thickness:)32
Geologic Description: LT GREY, F-C, FAIR-POOR SORT SST WITH ARG MATRIX. SCATTERED QZ, CHERT, VOLC PEBBLES. THIN COALY BDS IRREG BDD CARB SLTST AND SH,SOME SST,BIOTURB
Reported Environment: BRACKISH, DETATC SEDIMENTATION. MAJOR REGRESSION IN DENISON TROUGH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEQUENCE IS CHARACTERISTIC OF UPPER PART OF COMPLETE ALDEBARAN SECTION IN SPRINGSURE 4 AND 5

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -70 * Thickness:)333
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARARA SH, FREITAG FM, AND ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -70 * Thickness:)463
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PEAWADDY FM OF BBLENHEIM SUB-GR.AND CATHERINE SST, INGELARA SH,FREITAG FM AND ALDEBARAN SST OF GEBBIE SUB-GR.

CONTROL POINT: SPRINGSURE 11

REFERENCE # B118

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 31'09"S	147 58'00"E	+438	+438	-42	472	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 77 Page 147-163 Publn Year: 1976
Cross Reference: GRAY, A.R.G., 1980, QMJ VOL 81, P118-138

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:91 Base Elevation: +339 Thickness:)91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:91 Base Elevation: +339 Thickness:)91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:91 Base Elevation: +339 Thickness: 91
Geologic Description:
Reported Environment: PALUDAL AND LACUSTRINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOG DESCRIPTION NOT GIVEN IN REFERENCE

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:91 Base Elevation: +339 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:129 Base Elevation: +301 Thickness: 38
Geologic Description: INTBDD FINE-V FINE SST AND SLTST IN UPPER SEQ. SH, MDST, AND SLTST, WITH INTBDD TUFF IN LOWER SEQ. CARBONACEOUS.
Reported Environment: TRANSITIONAL BETWEEN MARINE AND PALUDAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks HIGHER GAMMA RAY READINGS IN LOWER PART

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:212 Base Elevation: +218 Thickness: 83

Geologic Description: TOP 40 M INTBDD SST, SLTST, SANDY SLTST, SH, WITH MINOR TUFF AND LST. SCATTERED SHELLS AND CRINOID FRAG. BOTTOM SLTST, SH, MDST, CRINOID FRAG.
Reported Environment: SHALLOW BASIN OF MUCH GREATER EXTENT THAN DENISON TROUGH. MARINE CONDITIONS FOR AT LEAST PART OF TIME. DELTAIC AND LACUSTRINE IN WEST.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	157	+273	28

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:212 Base Elevation: +218 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: INCLUDES BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: COLINEA SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -42 * Thickness: >260
Geologic Description: LT GREY, V FINE-V COARSE, FAIR-POOR SORT SST WITH ARG AND CALC MATRIX AND CARB PARTINGS. LESSER CARB SLTST AND SH
Reported Environment: RESTRICTED SEDIMENTATION ON SPRINGSURE SHELF
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: INTERVAL FROM 218-305 M CORRELATED TO CATHERINE SST (+212 TO +125 M ELEVATION)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -42 * Thickness: >260
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: INCLUDES COLINEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -42 * Thickness: >361
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: INCLUDES BLENHEIM SUB-GR: BLACK ALLEY SH AND PEAWADDY FM; AND GEBBIE SUB-GR: COLINEA SST

CONTROL POINT: SPRINGSURE 12

REFERENCE # B117

Organisation	Type	Mapno	Lat	Lang	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 25'00"S	147 57'00"E	+328	+329	-285	613	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 77 Page 147-163 Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:372 Base Elevation: -43 Thickness: 134
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 91 M. VALUES USED FOR CONTOUR MAPS.

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:372 Base Elevation: -43 Thickness: 371
Geologic Description: REFER TO SUBUNIT CORRELATIVES OF INGELARA SH (102-194 M), FREITAG FM (1 94-238 M), ALDEBARAN SST (238-372 M)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM EQUIV Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:194 Base Elevation: +135 Thickness: 92
Geologic Description: SLTST, SANDY SLTST, SH, WITH LESSER SST AND MINOR LST AND TUFF. LAMD-MASSIVE, BIOTURB. FOSSIL SHELLS IN LOWER PART
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS DEPTH INTERVAL 102-194 M IN COLINEA SST.

STRATIGRAPHY: FREITAG FM EQUIV Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:238 Base Elevation: +91 Thickness: 44
Geologic Description: MOSTLY SST WITH LESSER GREY TO DK GREY SLTST AND SH. BIOTURBATED BDG
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS DEPTH INTERVAL 194-238 M IN COLINEA SST.

STRATIGRAPHY: ALDEBARAN SST EQUIV Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:372 Base Elevation: -43 Thickness: 139
Geologic Description: SST AND CGL WITH MINOR SLTST AND COAL. SST IS FINE-V FINE, FAIR-WELL SORT, ARG, GRADED AND XBDS. CARB AND MICAC PARTINGS, CARBONIZED WOOD.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	351	-22	1.5

Tectonic Structure:
Remarks REPRESENTS DEPTH INTERVAL 238-372 M IN COLINEA SST.

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y105

Basal Information: Depth to Base:372 Base Elevation: -43 Thickness: 372
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES COLINEA SST (ALDEBARAN-FREITAG-INGELARA CORRELATIVE)

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:372 Base Elevation: -43 Thickness: 372
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDE GEBBIE SUB-GR: COLINEA SST (ALDEBARAN-FREITAG-INGELARA CORRELATIVE)

STRATIGRAPHY: DUCABROOK FM Age: CARBONIFEROUS Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -284 ± Thickness: >241
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SPRINGSURE 14

REFERENCE # B105 E

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 03'00"S	148 10'00"E	270	270	-632	902	#Z

REFERENCE: E1 RALFE, P.E.
PERMIAN STRATIGRAPHY OF THE SPRINGSURE-ARCTURUS DOWNS AREA
QUEENSLAND GOVERNMENT MINING JOURNAL V.83 (MARCH) Page 133-159 Publn Year: 1982
Cross Reference: HAWKINS, P.J. & RALFE, P.E., 1980, QGMJ VOL 81, P74-109.

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:E101
Basal Information: Depth to Base:18 Base Elevation: 252 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SEDIMENTS Age: TERTIARY Interpretation Code:E102
Basal Information: Depth to Base:24 Base Elevation: 246 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:E103
Basal Information: Depth to Base:TD Base Elevation: -632 Thickness:)848
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURSFICIAL DIP (GEOLOGIC MAP)

CONTROL POINT: SPRINGSURE 14-18

REFERENCE # B130

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 02'00"S	148 17'00"E	189	189	-2904	3893	C

REFERENCE: Y1 BALFE, P.E.
PERMIAN STRATIGRAPY OF THE SPRINGSURE-ARCTURUS DOWNS AREA

Page 133-159 Publn Year: 1982

Cross Reference: HAWKINS, P.J. & BALFE, P.E., 1980, QGMJ VOL 81, P74-109.

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:181 Base Elevation: +8 Thickness: >120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:181 Base Elevation: +8 Thickness: >120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1115 Base Elevation: -926? Thickness: 471?1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -438 M. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -2094$ Thickness: >265
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:57 Base Elevation: 132 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SECTION FROM SPRINGSURE 18

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:181 Base Elevation: 8 Thickness: 120

Geologic Description: 78%SST 11%MDST 11%COAL-TUFF. VF-F SILTY SST WITH FEW COARSE BEDS. THIN-THICK BDD,INTBDD-LAMD WITH MICAC CARB MDST. SCATTERED PLANT REMAINS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL AND INTBDD TUFF	94.6	94.6	11.6
TUFF, SPHERULITIC	145 CA	44	1
COAL (TOP?)	146.5	42.5	9.4

Tectonic Structure:
Remarks: THICKNESS CORRECTED FOR 15 DG AVG DIP. TOP ERODED PRIOR TO BASALT EXTRUSION. TUFFS ARE WEATHERED. SPRINGSURE 18

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:181 Base Elevation: 3 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). CONTAINS FAIR HILL FM

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:227 Base Elevation: -38 Thickness: 44
Geologic Description: 64%MDST 32%SLTST 4%SST; MNR TUFF. THINLY INTBDD-LAMD. COARSEN UP SST INTERVAL(215-222M) IS BIOTURB. MICAC, CARB, CALC, COALY LAM, BURROWS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	226	-37	0.29

Tectonic Structure:
Remarks: THICKNESS CORRECTER FOR 15 DG DIP(GEOLOGIC MAP).SPRINGSURE 18

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:227 Base Elevation: -38 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MACMILLAN FM. THICKNESS CORRECTED FOR 15 DG AVG DIP(GEOLOGIC MAP)

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:367 Base Elevation: -178 Thickness: 135
Geologic Description: 76%SST 19%MDST 5%SLTST. VF-F GRAIN, SILTY, WITH PBL BNDS. INTBDD, LAMD, XLAMD, THIN BDD, FLASER BDG AT TOP, BIOTURB T'OUT,CARB, MICAC, WOOD FRG
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: THICKNESS CORRECTER FOR 15 DG DIP (GEOLOGIC MAP). SPRINGSURE 18

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:507 Base Elevation: -318 Thickness: 135
Geologic Description: 75%MDST 25%SST; MNR TUFF, LST. COARSENS UP. LAMD, BIOTURB, CARB, CALC, SILTY, MICAC, PY, BURROWS, PLANT AND MARINE FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF, T'OUT L.SECT.			(0.25

Tectonic Structure:
Remarks: THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). SPRINGSURE 18

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:627 Base Elevation: -438 Thickness: 116
Geologic Description: SST MDST SLTST, MNR CGL. ALTERNATING SST AND MDST RICH LAYERS IN COARSENING UP CYCLES; BDG THINS TOWARD TOP. XLAMD,BIOTURB, RIPPLES, CARB, MICAC

Reported Environment: MARGINAL MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). SPRINGSURE 17-18

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1115 Base Elevation: -926 Thickness: 471
Geologic Description: 73%SST-CGL 18%MDST 9%SLTST MNR COAL. THIN-THICK BDD, LAMD, XLAMD, BIOTURB, CARB, MICAC, PLANT FOSS, BURROWS. U.SECT CGLITIC, L.SECT SEE REMARKS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks L.SECT SANDIER WITH FINING UP CYCLES OF MDST-SLTST-CARB MDST-COAL. THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1115 Base Elevation: -926 Thickness: 858
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATHERINE SST, INGELARA FM, FREITAG FM, ALDEBARAN SST. THICKNESS CORRECTED FOR 15 DG DIP.

STRATIGRAPHY: STAIRCASE SST MB Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1330 Base Elevation: -1141 Thickness: 208
Geologic Description: F-M SST, INTBDD-LAMD MDST-SLTST, AND MNR CGL. THICK-THIN BDD, BIOTURB, B
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). SPRINGSURE 17-16

STRATIGRAPHY: MOORODLOO MDST MB Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1428 Base Elevation: -1239 Thickness: 95
Geologic Description: GRADES FROM LT GY F-M SST AT TOP TO SLTST AND DK GY MDST BOTTOM. LAMD, BIOTURB, BURROWS, MARINE FOSSILS MOST COMMON AT BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). SPRINGSURE 16

STRATIGRAPHY: RIVERSTONE SST MB Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1618 Base Elevation: -1429 Thickness: 184
Geologic Description: 68%SST 17%SLTST 15%MDST AND MNR CGL. THICK-THIN BDD, LAMD, XLAMD; SLTST-MDST IRREG INTLAMD; BIOTURB & BURROWS COMMON. CALC, CARB, MARINE FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). SPRINGSURE 16

STRATIGRAPHY: NOSTYNDALE MDST MB Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:2018 Base Elevation: -1829 Thickness: 386
Geologic Description: MDST AND SILTY MDST, (5% SST. M-DK GY, LAMD, BIOTURB, SID BNDS, PY, CALC, BURROWS, MARINE AND PLANT FOSS. SST INTBDD WITH SLTST AND MDST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG AVG DIP(GEOLOGIC MAP) SPRINGSURE 15-16

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Yi15
Basal Information: Depth to Base:2018 Base Elevation: -1829 Thickness: 872
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP. CONTAINS STAIRCASE SST, MOOROOLOO MDST, RIVERSTONE SST AND MOSTYNDALE MDST MEMBERS

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Yi16
Basal Information: Depth to Base:2018 Base Elevation: -1829 Thickness: 872
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP. CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Yi17
Basal Information: Depth to Base:2018 Base Elevation: -1829 Thickness: 1774
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP, MACMILLAN, CATHERINE, INGELARA, FREITAG, ALDEBARAN, CATTLE CREEK FM

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Yi18
Basal Information: Depth to Base:TD Base Elevation: -2904± Thickness: >1038
Geologic Description: 47%MDST 32%SST 20%SLTST 1%COAL AND MNR TERTIARY? BASALT INTRUS. CARB, SID, GLOSSOPTERIS, FACETED DROPSTONE? PBLS, INTBDD-LAMD. COAL MAINLY DULL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, THIN SMS T'OUT <1.9
BASALT INTRUSIVES <9
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks SPRINGSURE 14-15. THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

CONTROL POINT: SPRINGSURE 15

REFERENCE # B104 D

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 03'00"S	148 12'00"E	225	225	-498	723	*Z

REFERENCE: D1 BALFE, P.E.
PERMIAN STRATIGRAPHY OF THE SPRINGSURE-ARCTURUS DOWNS AREA
QUEENSLAND GOVERNMENT MINING JOURNAL V.83 (MARCH) Page 133-159 Publn Year: 1982
Cross Reference: HAWKINS, P.J. & BALFE, P.E., 1980, QGMJ VOL 81, P74-109.

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: MOSTYNDALE MDST MB Age: PERMIAN Interpretation Code:D101
Basal Information: Depth to Base:266 Base Elevation: -41 Thickness: 257
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:D102
Basal Information: Depth to Base:266 Base Elevation: -41 Thickness: 257
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:D103
Basal Information: Depth to Base:266 Base Elevation: -41 Thickness: 257
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:D104
Basal Information: Depth to Base:266 Base Elevation: -41 Thickness: 257
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP) CATTLE CREEK FM

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:D105
Basal Information: Depth to Base:TD Base Elevation: -498* Thickness: >441
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

CONTROL POINT: SPRINGSURE 16

REFERENCE # R103Y1
REFERENCE # B1C3 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 03'00"S	148 14'00"E	224	224	-673	897	#Z

REFERENCE: HAWKINS, P.J., AND BALFE, P.E.
DEPARTMENTAL STRATIGRAPIC DRILLING IN QUEENSLAND
QUEEN.. (D) GOVERNMENT MINING JOURNAL V 81 Page 74-109 Publn Year: 1980

Cross Reference:

REFERENCE: C1 BALFE, P.E.
PERMIAN STRATIGRAPHY OF THE SPRINGSURE-ARCTURUS DOWNS AREA
QUEENSLAND GOVERNMENT MINING JOURNAL V.83 (MARCH) Page 133-159 Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:C101
Basal Information: Depth to Base:83 Base Elevation: 141 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:C102
Basal Information: Depth to Base:83 Base Elevation: 141 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). ALDEBARAN SST

STRATIGRAPHY: STAIRCASE SST MB Age: PERMIAN Interpretation Code:C103
Basal Information: Depth to Base:296 Base Elevation: -72 Thickness: 206
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: MOOROOLOO MDST MB Age: PERMIAN Interpretation Code:C104
Basal Information: Depth to Base:394 Base Elevation: -170 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: RIVERSTONE SST MB Age: PERMIAN Interpretation Code:C105
Basal Information: Depth to Base:584 Base Elevation: -360 Thickness: 184
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: MOSTYNDALE MDST MB Age: PERMIAN Interpretation Code:C106
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness: >302
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:C107
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness: >786
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICK CORRECTED FOR 15 DG DIP(GEOL.MAP). STAIRCASE SST, MODRODLOO MDST, RIVERSTON SST, MOSTYNDALE MDST

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:C108
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness: >786
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:C109
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness: >866
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP). CATTLE CREEK FM CONTAINS ALDEBARAN SST AND CATTLE CREEK FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:56 Base Elevation: 168 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:56 Base Elevation: 168 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks ALDEBARAN SST. THICKNESS CORRECTED FOR 15 DG(CA) DIP.

STRATIGRAPHY: STAIRCASE SST MB Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:315 Base Elevation: -91 Thickness: 259

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP) BELONGS TO CATTLE CREEK FM.

STRATIGRAPHY: MIDDLE MUDSTONE MB Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:394 Base Elevation: -170 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks IN CATTLE CREEK FM. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: RIVERSTONE SST MB Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:620 Base Elevation: -396 Thickness: 218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks IN CATTLE CREEK FM. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: LOWER MUDSTONE MB Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness:)268
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks IN CATTLE CREEK FM. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness:)812
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG E
Remarks THICKNESS CORRECTED FOR 15 DG(CA) DIP. STAIRCASE SST, MIDDLE MUDSTONE, RIVERSTONE SST, AND LOWER MUDSTONE MEMBERS.

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness:)812
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks CATTLE CREEK FM. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP(GEOLOGIC MAP)

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -673* Thickness:)866
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks CATTLE CREEK FM. ALDEBARAN SST. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP(GEOLOGIC MAP)

CONTROL POINT: SPRINGSURE 17

REFERENCE # B182Y1
REFERENCE # B182 B

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 02'00"S	148 16'00"E	194	194	-706	900	AZ

REFERENCE: HAWKINS, P.J., AND BALFE, P.E.
DEPARTMENTAL STRATIGRAPIC DRILLING IN QUEENSLAND
QUEENSLAND GOVERNMENT MINING JOURNAL V 81 Page 74-109 Publn Year: 1980

Cross Reference:

REFERENCE: B1 BALFE, P.E.
PERMIAN STRATIGRAPHY OF THE SPRINGSURE-ARCTURUS DOWNS AREA
QUEENSLAND GOVERNMENT MINING JOURNAL V.83 (MARCH) Page 133-159 Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:B101
Basal Information: Depth to Base:82 Base Elevation: 112 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:B102
Basal Information: Depth to Base:195 Base Elevation: -1 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:B103
Basal Information: Depth to Base:683 Base Elevation: -489 Thickness: 471
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: CEBBIE SUB-GP Age: PERMIAN Interpretation Code:B104
Basal Information: Depth to Base:683 Base Elevation: -489 Thickness: 660
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP) INGELARA FM, FREITAG FM, ALDEBARAN SST

STRATIGRAPHY: STAIRCASE SST MB Age: PERMIAN Interpretation Code:B105
Basal Information: Depth to Base:TD Base Elevation: -706± Thickness: >218
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:	E FLANK SPRINGSURE DOME. DIPS 12-20 DG				
Remarks	THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)				IN CATTLE CREEK FM
STRATIGRAPHY:	CATTLE CREEK FM	Age: PERMIAN		Interpretation Code:B106	
Basal Information:	Depth to Base:TD	Base Elevation: -706*		Thickness: >210	
Geologic Description:					
Reported Environment:					
Interpreted Environment:					
Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:	E FLANK SPRINGSURE DOME. DIPS 12-20 DG				
Remarks	THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)				STAIRCASE SST MB
STRATIGRAPHY:	TIVERTON SUB-GP	Age: PERMIAN		Interpretation Code:B107	
Basal Information:	Depth to Base:TD	Base Elevation: -706*		Thickness: >210	
Geologic Description:					
Reported Environment:					
Interpreted Environment:					
Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:	E FLANK SPRINGSURE DOME. DIPS 12-20 DG				
Remarks	THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)				CATTLE CREEK FM
STRATIGRAPHY:	BACK CREEK GP	Age: PERMIAN		Interpretation Code:B108	
Basal Information:	Depth to Base:TD	Base Elevation: -706 *		Thickness: >869	
Geologic Description:					
Reported Environment:					
Interpreted Environment:					
Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:	E FLANK SPRINGSURE DOME. DIPS 12-20 DG				
Remarks	THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)				INGELARA FM FREITAG FM ALDEBARA SST CATTLE CK
STRATIGRAPHY:	BASALT	Age: TERTIARY		Interpretation Code:Y101	
Basal Information:	Depth to Base:16	Base Elevation: 178		Thickness: 16	
Geologic Description:					
Reported Environment:					
Interpreted Environment:					
Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:					
Remarks					
STRATIGRAPHY:	INGELARA FM	Age: PERMIAN		Interpretation Code:Y102	
Basal Information:	Depth to Base:62	Base Elevation: 112		Thickness: 64	
Geologic Description:					
Reported Environment:					
Interpreted Environment:					
Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:	E FLANK SPRINGSURE DOME. DIPS E 12-20 DG				
Remarks	THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP ON GEOLOGIC MAP.				
STRATIGRAPHY:	FREITAG FM	Age: PERMIAN		Interpretation Code:Y103	
Basal Information:	Depth to Base:116	Base Elevation: 78		Thickness: 33	
Geologic Description:					
Reported Environment:					
Interpreted Environment:					
Geologic Features:	Feature	Depth	Elevation	Thickness	
Tectonic Structure:	E FLANK SPRINGSURE DOME. DIPS E 12-20 DG				
Remarks	THICKNESS CORRECTED FOR 15 DG(CA) DIP ON SURFICIAL GEOLOGIC MAP.				
STRATIGRAPHY:	ALDEBARAN SST	Age: PERMIAN		Interpretation Code:Y104	
Basal Information:	Depth to Base:626	Base Elevation: -432		Thickness: 493	

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) DIP AT SURFACE (GEOLOGIC MAP)

STRATIGRAPHY: CEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:626 Base Elevation: -432 Thickness: 589
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks INGELARA FM, FREITAG FM, ALDEBARAN SST. THICKNESS CORRECTED FOR 15 DG (CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -706 Thickness: >265
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG(CA) SURFICIA DIP (GEOLOGIC MAP)

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -706# Thickness: >265
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks CATTLE CREEK FM. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -706# Thickness: >854
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks INGELARA FM, FREITAG FM, ALDEBARAN SST, CATTLE CREEK FM. THICKNESS CORRECTED FOR 15 DG(CA) DIP ON GEOLOGIC MAP.

CONTROL POINT: SPRINGSURE 18

REFERENCE # B181Y1
REFERENCE # B181 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 02'00"S	148 17'00"E	189	189	-472	661	*Z

REFERENCE: HAWKINS, P.J., AND BALFE, P.E.
DEPARTMENTAL STRATIGRAPIC DRILLING IN QUEENSLAND
QUEENSLAND GOVERNMENT MINING JOURNAL V 81 Page 74-139 Publn Year: 1980
Cross Reference:

REFERENCE: A1 BALFE, P.E.
PERMIAN STRATIGRAPHY OF THE SPRINGSURE-ARCTURUS DOWNS AREA
QUEENSLAND GOVERNMENT MINING JOURNAL V.83 (MARCH) Page 133-159 Publn Year: 1982
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:A101
Basal Information: Depth to Base:57 Base Elevation: 132 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FAIR HILL FM Age: PERMIAN Interpretation Code:A102
Basal Information: Depth to Base:181 Base Elevation: 8 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:A103
Basal Information: Depth to Base:181 Base Elevation: 8 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOL.MAP). FAIR HILL FM.

STRATIGRAPHY: MACMILLAN FM Age: PERMIAN Interpretation Code:A104
Basal Information: Depth to Base:227 Base Elevation: -38 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:A105
Basal Information: Depth to Base:227 Base Elevation: -38 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP) MACMILLAN FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:A186
Basal Information: Depth to Base:367 Base Elevation: -178 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:A107
Basal Information: Depth to Base:507 Base Elevation: -318 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:A108
Basal Information: Depth to Base:608 Base Elevation: -419 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:A109
Basal Information: Depth to Base:TD Base Elevation: -472* Thickness: >51
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:A110
Basal Information: Depth to Base:TD Base Elevation: -472* Thickness: >419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOL.MAP). CATHERINE SST, INGELARA FM,FREITAG FM, ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:A111
Basal Information: Depth to Base:TD Base Elevation: -472* Thickness: >464
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS CORRECTED FOR 15 DG DIP(GEOLOGIC MAP)

STRATIGRAPHY: BASALT Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:57 Base Elevation: 132 Thickness: 57

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:227 Base Elevation: -38 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(CA)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:227 Base Elevation: -38 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PEAWADDY FM. THICKNESS CORRECTED FOR 15 DG(CA) SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:435 Base Elevation: -246 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR 15 DG DIP(CA)

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:507 Base Elevation: -318 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR APPROXIMATE 15 DG DIP ON SURFACE (FROM GEOLOGIC MAP)

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:538 Base Elevation: -349 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR APPROXIMATE 15 DG DIP ON SURFICIAL DIP(GEOLOGIC MAP)

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -472# Thickness: >119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks THICKNESS CORRECTED FOR APPROXIMATE 15 DG SURFICIAL DIP (GEOLOGIC MAP)

STRATIGRAPHY: GERBIE SUB-GP Age: PERMIAN Interpretation Code:Y168
Basal Information: Depth to Base:TD Base Elevation: -472* Thickness: >419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks CONTAINS CATHERINE SST, INGELARA FM, FREITAG FM, ALDEBARAN SST. THICKNESS CORRECTED FOR 15 DG(CA) DIP(GEOLOGIC MAP)

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y169
Basal Information: Depth to Base:TD Base Elevation: -472 Thickness: >583
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: E FLANK SPRINGSURE DOME. DIPS E 12-20 DG
Remarks PEAWADDY FM, CATHERINE SST, INGELARA FM, FREITAG FM, ALDEBARAN SST. THICKNESS CORRECTED FOR 15 DG DIP(CA) ON GEOL. MAP.

CONTROL POINT: SPRINGSURE 19

REFERENCE # B126

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 41'16"S	148 08'26"E	+378	+380	-857	1237	

REFERENCE: GEOLOGICAL SURVEY OF QUEENSLAND
BORE LOG AND LITHOLOGIC LOG, CSQ SPRINGSURE 19
UNPUBLSIHED WELL REPORTS
Page Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: BENDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:446 Base Elevation: -66 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:446 Base Elevation: -66 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1118 Base Elevation: -738 Thickness: 293
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -445 M. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1231 Base Elevation: -851 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: QUATERNARY DEPOSITS Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:27 Base Elevation: +353 Thickness: 25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARCADIA FM Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:280 Base Elevation: +100 Thickness: 253

Geologic Description: RED-BR TO LT GN-GY SS, MDST, MINOR SLTST. SS IS LI-LAB, GOOD-WELL SORT. LAM, X-BDD, FINE UP CYCLES. PBL AND MUD CLASTS, CARB FRAG-LAM, MOTTLED.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SAGITTARIUS SST Age: TRIASSIC Interpretation Code:Y183
Basal Information: Depth to Base:361 Base Elevation: +19 Thickness: 81
Geologic Description: GREEN TO GREY-GREEN LI-LAB SS AND MDST. POOR-WELL SORT. LAM X-LAM IRREG BDG; FINE UP CYCLES, SOFT SED DEF. CALC, CARB, PLANT FOSS, SOME BURROWS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y184
Basal Information: Depth to Base:361 Base Elevation: +19 Thickness: 334
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARCADIA AND SAGITARIUS FM.

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:446 Base Elevation: -66 Thickness: 85
Geologic Description: GY-WH TO BLK MDST, SILTY MDST, SS, CARB SH, MINOR COAL. LAM, X-LAM, IRREG BDG. LI, LAB, CALC, TFAC, CARB FRAG. PLANT FOSS, BIOTURB?, CALC VEINS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, DULL + CARB SH	362	18	<1
COAL, MOSTLY DULL	378	2	<1

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:446 Base Elevation: -66 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:515 Base Elevation: -135 Thickness: 69
Geologic Description: GREY-BLACK MDST AND CREAM-WHITE TUFF. THICK BDD TO LAM AND IRREG. TFAC, PY AND SID NOD, CALC.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
TUFF T'OUT
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:615 Base Elevation: -235 Thickness: 100
Geologic Description: WH TO DK GY LI-LAB TO SUB-LAB SS; DK GY MDST, S'TIMES SILTY-SANDY,MDST AT TOP HAS MARINE FOSS. MOSTLY THIN LAM X-LAM OR IRREG BDG. FOSS PLANT
Reported Environment: REM
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
FOSSILIFERROUS MDST	517	-137	2
TUFF	568	-188	1

Tectonic Structure:
Remarks: SOFT SEDIMENT STRUCTURES INCLUDE BALL AND PILLOW AND SLUMPING

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:615 Base Elevation: -235 Thickness: 169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:735 Base Elevation: -355 Thickness: 120
Geologic Description: WH-LT GY FELD SUB-LAB SS WITH LESSER DK GY MDST. VF-C GRAINED, GRANULE-PBL BNDS. BDG THICK TO LAM AND X-LAM, IRREG, BIOTURB. CARB FRAG, BURROWS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CYLINDRICAL BURROWS PRESENT. SOFT SED DEF.

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:773 Base Elevation: -393 Thickness: 38
Geologic Description: SANDY-PEBBLY MDST AND MINOR TUFF AND LI-LAB SS. DK GY-BLK, POOR-FAIR SORT, THIN TO LAM OR IRREG BDG. MARINE FOSS FRAG.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:825 Base Elevation: -445 Thickness: 52
Geologic Description: WHITE-LT GREY LI-LAB SS AND DK GREY MDST. VF-C GRAINED, POOR-WELL SORT. BDG IS THIN TO LAM AND X-LAM. BIOTURBATED.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1118 Base Elevation: -738 Thickness: 293
Geologic Description: WH-GY PREDOM LI SUB-LAB TO QZOSE SS, DK GY SANDY MDST, CGL, MINOR COAL. POOR-WELL SORT, VF-C-PBL GRAINED. MASS, THICK-THIN BDD, LAM,(SEE REMARK)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: X-BDD-LAM, IRREG, BIOTURB, GENERALLY FINE UP CYCLES. PY, CALC AT BASE. CARB, FOSS WOOD.

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:1118 Base Elevation: -738 Thickness: 504
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS CATHERINE SS, INGELARA SH, FREITAG FM, ASLEBARAN SS.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:1209 Base Elevation: -829 Thickness: 91
Geologic Description: LT-GY TO BLK SANDY MDST ABOVE PEBBLY SANDY MDST; MINOR SS AND CGL. BDG IS THIN, IRREG, LAM, BIOTURBATED. BRACH FRAG; POORLY PRESERVED PLANT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:1209 Base Elevation: -829 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y117
Basal Information: Depth to Base:1209 Base Elevation: -829 Thickness: 763
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME SEDS Age: PERMIAN Interpretation Code:Y118
Basal Information: Depth to Base:1231 Base Elevation: -851 Thickness: 22
Geologic Description: CREAM AND GREY-GREEN TO GREY CONGLOMERATE AND MINOR SANDY MDST. THIN-THICK BDD. MATRIX SUPPORT TOP, FRAMWORK BELOW. BASEMENT CLASTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PALAEOZOIC Interpretation Code:Y119
Basal Information: Depth to Base:TD Base Elevation: -857 ± Thickness:)6
Geologic Description: DK GY TO BLK SILICEOUS MDST, AND WHITE ARENITE. TECTONIZED. QZ VEINS IN ARENITE, SCHISTOSITY IN MDST.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 10-70 DG DIP. AT LEAST TWO FOLD EVENTS
Remarks NO THICKNESS CORRECTION FOR DIP.

CONTROL POINT: SPRINGSURE S

REFERENCE # B119

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 34'00"S	148 23'00"E	+302	+302	-615	917	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 77 Page P147-163 Publn Year: 1976
Cross Reference: GRAY, A.R.G., 1980, QMJ VOL 81, P110-130

SEDIMENTARY BASIN: BOWEN, SOUTH WEST

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:671 Base Elevation: -369 Thickness: >581t
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION 302 M AT SURFACE VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:671 Base Elevation: -369 Thickness: 581t
Geologic Description: SST AND CGL WITH MINOR DK SLTST, SH, MDST, AND COAL. CARB AND MICAC PARTINGS. LOWER 68 M SST BETTER SORT, BIOTURB. UPPER POOR SORT, ARG, COAL.
Reported Environment: REGRESSIVE SEQUENCE. BRACKISH WATER, DELTAIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SMS, UPPER SEQ <1 M
Tectonic Structure: CONSUELO ANTICLINE. SURF DIPS 15-45 DG W
Remarks CONTAINS POOR QUALITY COAL SEAMS 0.3 TO 1 M THICK. THICKNESS CORRECTED FOR 30 DEG DIP

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:671 Base Elevation: -369 Thickness: 581
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -615 # Thickness: >213t
Geologic Description: SIRIUS MDST MB: THIN BDD AND LAND SANDY SLTST, SLTST, SH, MINOR SST. FOSS SHELLS BASAL 6 M AND MIDDLE. STAIRCASE SST BM: F TIGHT SST,FOSS SHELLS
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SIRIUS MDST MB 790 -488 119
STAIRCASE SST MB TD >127
Tectonic Structure: CONSUELO ANTICLINE. SURF DIPS 15-45 DG
Remarks THICKNESS CORRECTED FOR 30 DG DIP

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -615 # Thickness: >213
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES CATTLE CREEK FM.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:TD Base Elevation: -615 ± Thickness:)794
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES GEBBIE SUB-GR. ALDEBARAN SST; AND TIVERTON SUB-GR ; CATTLE CREEK FM

CONTROL POINT: SPRINGSURE 7-9

REFERENCE # 8112

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 16'00"S	148 14'00"E	+293	+293	-785	1078	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 77 Page 147-163 Publn Year: 1976
Cross Reference: GRAY, A.R.G, 1980, QGMJ VOL 81, P110-130

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -785 ft Thickness: >243
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:835 Base Elevation: -542 Thickness: 723t
Geologic Description: LT GREY SST, VF-VC GRAINED, FAIR-POOR SORTING,ARG, CALC, XBDD, AND BIOTURB. DK SH AND SLTST; CARB, PTY. IRON-RICH BDS. MARINE AND PLANT FOSS.
Reported Environment: RETURNED TO MARINE CONDITIONS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
STAIRCASE SST MB	213	+89	184
MIDDLE MUDSTONE MB	463	-170	217
RIVERSTONE SST MB	586	-293	107
LOWER MUDSTONE MB	835	-542	215

Tectonic Structure: SPRINGSURE ANTICLINE.SURF DIP 15-45 DG E
Remarks: THICKNESS CORRECTED FOR 30 DEG DIP

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:835 Base Elevation: -542 Thickness: 723
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES CATTLE CREEK FM. THICKNESS CORRECTED FOR 30 DG DIP

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:835 Base Elevation: -542 Thickness: 723
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES TIVERTON SUB-GP: CATTLE CREEK FM

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -785 ft Thickness: >210t
Geologic Description: THIN BDD SH, SLTST, AND SST, WITH MINOR COAL AND THIN VESICULAR BAS SI LLS. SH AND SLTS CARB. SST HAS CARB AND MICAC PARTINGS.
Reported Environment: SHALLOW SWAMPY WATER
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL BNS, DULL			(0.3 M

VOLCANIC BASALT

Tectonic Structure: SPRINGSURE ANTICLINE SURF DIP 15-45 DG E

Remarks THICKNESS CORRECTED FOR 30 DG DIP

CONTROL POINT: STRUAN 1

REFERENCE # B109Y1
REFERENCE # B109Y2
REFERENCE # B109X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH, CORE + WIRELINE	SG/55-4	24 07'30"S	148 37'15"E	+198	+203	-1636	1839	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.F.O. STRUAN NO.1 WELL, QUEENSLAND. WELL COMPLETION REPORT
MINES ADMINISTRATION UNPUBLISHED REPORT Q/55-56P/222 (BHR FILE 64/4117)
Page Publn Year: 1965
Cross Reference:

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130
Page 115; TBL 5 Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:174 Base Elevation: +29 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:458 Base Elevation: -255 Thickness: 284
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:458 Base Elevation: -255 Thickness: 284
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:671 Base Elevation: -468 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1019 Base Elevation: -816 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1523 Base Elevation: -1320 Thickness: 504
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:1804 Base Elevation: -1601 Thickness: 281
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X165
Basal Information: Depth to Base:1804 Base Elevation: -1601 Thickness: 281
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X170
Basal Information: Depth to Base:TD Base Elevation: -1636# Thickness:)35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:30 Base Elevation: +173 Thickness: 26
Geologic Description: LATERITE AND UNCONSOLIDATED QZ SANDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:442 Base Elevation: -239 Thickness: 412
Geologic Description: SLTST AND SH WITH MINOR SST (30-204 M). CARB SH AND COAL, MINOR SST (294-335 M). QZ-LITHIC SST AND SH (335-442 M). PLANT FOSSILS COMMON
Reported Environment: CONTINENTAL
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
COAL INT: 12 SMS 335 -132 131
Tectonic Structure:
Remarks EQUIV TO UPPER 411 M OF BANDANNA IN COMPLETION REPT; DEPTH TO BASE AND THICKNESS APPROX. COAL SEAMS 2-7 M THICK

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:442 Base Elevation: -239 Thickness: 412
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM. DEPTH TO BASE AND THICKNESS APPROX.

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:561 Base Elevation: -358 Thickness: 119
Geologic Description: DK-LT GY CARB SH WITH SLTST INTBDS IN UPPER PART. LOWER SECTION - FINE GR, WELL SRTD SST WITH SUBORDINATE SLTST. BOTH LT GY, CARB, QZ-LITHIC
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO LOWER 119 M OF BANDANNA FM IN COMPLETION REPORT. THICKNESS IS APPROXIMATE

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:933 Base Elevation: -730 Thickness: 372
Geologic Description: SLTST WITH INTBDD CARB SH AND SST. COAL BENEATH MANUTAN BD. SST IN TOP SPECKLED WITH ORG AND LITHIC GRAINS. LOWER SEQ CARB SLTST, SH, MINOR SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
MANTUAN CORR:CALC-LI 566 -363 5
COAL: 2 THICK SEAMS 578 -375 12
Tectonic Structure:
Remarks EQUIVALENT TO MANTUAN FM AND DRY CREEK SH OF WELL REPORT. MANTUAN BED CORRELATED TO ARCTURUS 1 BY PALYNOLOGY

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:933 Base Elevation: -730 Thickness: 491
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:968 Base Elevation: -765 Thickness: 35
Geologic Description: SLTST SEQ BETWEEN 2 WELL DEVELOPED SST UNITS. UPPER SST IS F-C GR, POOR-WELL SRTD, CLEAN-ARG, QZOSE. MIDDLE CARB SLTST. LOWER POORLY SRTD QZ SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 922 -719 1
COAL 931 -728 1
Tectonic Structure:
Remarks EQUIVALENT TO EARLY STORMS SST IN COMPLETION REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1019 Base Elevation: -816 Thickness: 51
Geologic Description: ARGILLACEOUS SEQUENCE OF INTBDD SLTST AND CARB SH. MINOR SST AT TOP. SHALE DISTINCTIVELY MULTICOLOURED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:1523 Base Elevation: -1326 Thickness: 504
Geologic Description: UPPER SECT OF M-C GR, WELL SRTD, SILICIFIED-ARG GZ SST. MIDDLE SST BECOMES F GR + LITHIC (PLAG-CHERT). LOWER SST INTBDD WITH SOME CARB SLTST, SH
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1274	-1071	1
COAL	1283	-1080	1
COAL	1292	-1089	1

Tectonic Structure:
Remarks: COAL REPORTED IN LOWER ALDEBARAN APPEARS IN MIDDLE ON WELL LOG

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1523 Base Elevation: -1326 Thickness: 590
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -1636@ Thickness:)316
Geologic Description: SLTST AND SH WITH SST INTERVALS, COAL AND LST. MARINE FOSS (BRYOZOANS) IN UPPER PART. LOWER PART CARB WITH PLANT FOSSILS AND COAL SEAMS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LST: BRYOZOANS	1684	-1461	16
COAL	1807	-1604	3
COAL	1824	-1621	1
COAL	1829	-1626	1

Tectonic Structure:
Remarks: STANLEIGH SH MB - BASAL 32 M

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1636@ Thickness:)316
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -1636@ Thickness:)1397
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:192 Base Elevation: +11 Thickness: 190
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:457 Base Elevation: -254 Thickness: 265
Geologic Description:
Reported Environment: FLUVIAL, LACUSTRINE, PALUDAL. COAL MEASURES LAID DOWN IN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:494 Base Elevation: -291 Thickness: 37
Geologic Description:
Reported Environment: COLD BRACKISH WATER WITH EUXINIC CONDITIONS. TRANSITIONAL FROM MARINE TO FRESHWATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:649 Base Elevation: -446 Thickness: 155
Geologic Description:
Reported Environment: DEPOSITED IN A MARINE AND AT TIMES BRACKSIH DELTA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks "GERMAN CREEK CM" EQUIV TO MACMILLAN FM + GERMAN CREEK FM + CROCKER FM

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:933 Base Elevation: -730 Thickness: 284
Geologic Description:
Reported Environment: MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:933 Base Elevation: -730 Thickness: 476
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH, GERMAN CREEK CM AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:966 Base Elevation: -763 Thickness: 33
Geologic Description:
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1018 Base Elevation: -815 Thickness: 52

Geologic Description:
Reported Environment: RELATIVELY DEEP QUIET WATER WITH EUXINIC CONDITIONS AND LITTLE EFFECTIVE REWORKING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1524 Base Elevation: -1321 Thickness: 506
Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1524 Base Elevation: -1321 Thickness: 594
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1804 Base Elevation: -1601 Thickness: 280
Geologic Description:
Reported Environment: MARINE WITH BRACKISH - FRESH WATER ENVIRONMENTS EXISTING AT TIMES AROUND THE MARGINS OF THE BASIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:1804 Base Elevation: -1601 Thickness: 280
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:1804 Base Elevation: -1601 Thickness: 1347
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y214
Basal Information: Depth to Base:TD Base Elevation: -16368 Thickness: 335
Geologic Description:
Reported Environment: NON-MARINE WITH OCCASIONAL MARINE INCURSIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO STANLEIGH SH MB OF CATTLE CREEK FM IN COMPLETION REPORT

CONTROL POINT: SUNLIGHT 1

REFERENCE # B114

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDR, CORE + WIRELINE	SG/55-4	24 16'00"S	148 51'15"E	+255	+259	-1265	1524	

REFERENCE: DICKINS, J.M., AND MALONE, E.J.
THE GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 138 Page 115; TBL 5 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:-136 Base Elevation: >390 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALES USED FOR CONTOUR MAPS

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:695 Base Elevation: -436 Thickness: 300
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:695 Base Elevation: -436 Thickness: 300
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION.

STRATIGRAPHY: CROCKER FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:872 Base Elevation: -613 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:1357 Base Elevation: -1098 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -956 M. VALUES USED FOR CONTOUR MAPS.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:394 Base Elevation: -136 Thickness: 398

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:695 Base Elevation: -436 Thickness: 300
Geologic Description:
Reported Environment: MOSTLY FLUVIAL WITH LACUSTRINE AND PALUDAL ENVIRONMENTS. COAL-BEARING SEQUENCES DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:774 Base Elevation: -515 Thickness: 79
Geologic Description:
Reported Environment: COLD BRACKISH WATER WITH EUXINIC CONDITIONS. MARINE - PARALIC ENVIRONMENTS AND TRANSITION FROM MARINE TO FRESH WATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:875 Base Elevation: -616 Thickness: 101
Geologic Description:
Reported Environment: MARINE - BRACKISH DELTA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks "GERMAN CREEK CM" EQUIV TO MACMILLAN FM + GERMAN CREEK FM + CROCKER FM

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1198 Base Elevation: -939 Thickness: 323
Geologic Description:
Reported Environment: MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1198 Base Elevation: -939 Thickness: 503
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH, GERMAN CREEK CM AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1202 Base Elevation: -943 Thickness: 4
Geologic Description:
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:1215 Base Elevation: -956 Thickness: 13
Geologic Description:
Reported Environment: RELATIVELY DEEP MARINE WITH LITTLE REWORKING OF SEDIMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:1357 Base Elevation: -1098 Thickness: 142
Geologic Description:
Reported Environment: DETLAIC, PARTLY BRACKISH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERBIE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1357 Base Elevation: -1098 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1482 Base Elevation: -1223 Thickness: 125
Geologic Description:
Reported Environment: GENERALLY MARINE WITH BRACKISH TO FRESHWATER ENVIRONMENTS EXISTING AT TIMES AROUND THE MARGINS OF THE BASIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUFFEL FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1510 Base Elevation: -1251 Thickness: 28
Geologic Description: CONSISTS ALMOST COMPLETELY OF LIMESTONE (P.40)
Reported Environment: COLD SHALLOW WATER A CONSIDERABLE DISTANCE FROM LAND BEYOND REACH OF CLASTIC SEDIMENTATION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1510 Base Elevation: -1251 Thickness: 153
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK AND BUFFEL FMS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:1510 Base Elevation: -1251 Thickness: 815
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:TD Base Elevation: -12658 Thickness: >14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TAROOM 10

REFERENCE # B136Y1
REFERENCE # B136Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-8	25 13'00"S	148 47'00"E	+302	+304	-926	1230	?

REFERENCE: Y1 HEYWOOD, P.B.
STRATIGRAPHIC DRILLING REPORT - GSQ TAROOM 10
QUEENSLAND GOVERNMENT MINING JOURNAL, 78 Page 565-584 Publn Year: 1977
Cross Reference:

REFERENCE: Y2 GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81 Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:212 Base Elevation: +92 Thickness: >210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:408 Base Elevation: -104 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:408 Base Elevation: -104 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:212 Base Elevation: +92 Thickness: 210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:408 Base Elevation: -104 Thickness: 196
Geologic Description: F-LAB-MICAC AND F-CLI-LAB-MICAC SST, GY LAMD SLTST, COAL, LAMD BENTONITIC TFAC MDST, DK GY CARB SH; INTBDD; PLANT FOSSILS AND CARB FRAGMENTS.
Reported Environment: PALUDAL TO LACUSTRINE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL	306	-2	2
	COAL	318	-14	1
	COAL	339	-35	1
	TUFF	376	-72	6

Tectonic Structure:
Remarks: TUFF AT 400 M DEPTH (-96 MSL) IS 4 M THICK

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:408 Base Elevation: -104 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:688 Base Elevation: -384 Thickness: 280
Geologic Description: DK GY-BLK PARTLY PY MDST AND SH, MICAC CARB SLTST (CHERTY INTERVALS), BENTONITIC TUFF, FINE LAB SST; INTBDD; PLANT FOSS TOP; ACRITARCHS BASE
Reported Environment: LOW ENERGY MARINE IN LOWER PART GRADING TO BRACKISH AND FRESHWATER IN UPPER PART.
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: P3C (ACRITARCH ZONE) AND US PALYNOSTRATIGRAPHIC UNITS (MCKELLAR, 1977)

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:743 Base Elevation: -439 Thickness: 55
Geologic Description: DK GY PARTLY CALC MDST AND SH WITH MINOR LT GY SLTST OVERLAIN BY LAB-SUBLAB SST AND GY PARTLY CALC SLTST; LAMB BDG, BIOTURBATED; MARINE FOSSILS
Reported Environment: LOW ENERGY MARINE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:743 Base Elevation: -439 Thickness: 335
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS BLACK ALLEY SHALE AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:811 Base Elevation: -507 Thickness: 68
Geologic Description: DK GY POORLY LAMD MDST WITH SCATTERED GN TUFF (SOME INTBDD), AND MINOR CONE-IN-CONE LST; MARINE FOSS (CRINOID STEMS, BRACHS, TABULATE CORAL)
Reported Environment: LOW ENERGY MARINE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: US PALYNOSTRATIGRAPHC UNIT (MCKELLAR 1977)

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:811 Base Elevation: -507 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:

Remarks CONTAINS INGELARA FM

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -926 * Thickness: >419
Geologic Description: MICAC-PY-CARB-SANDY SLTST AND DK GY-BLK SILTY MDST AND SH, GREEN SUB-LAB SST AND MINOR COQ, COAL, AND CGL; MARINE FOSSILS, BURROWS, PLANT FOSS.
Reported Environment: LOW ENERGY MARINE AT BASE; FRESHWATER GRADING TO BRACKISH AND SHALLOW WATER MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1101	-797	1
COAL	1134	-830	2

Tectonic Structure:
Remarks 3 TO U4B PALNOSTATIGRAPHC UNITS (MCKELLAR, 1977)

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -926 * Thickness: >419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -926 * Thickness: >822
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickners
Tectonic Structure:
Remarks BLENHEIM SUB-GR (BLACK ALLEY SH, PEAWADDY FM), GEBBIE SUB-GR (INGELARA FM), TIVERTON SUB-GROUP (CATTLE CREEK FM)

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:212 Base Elevation: +92 Thickness: 216
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:408 Base Elevation: -104 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:408 Base Elevation: -104 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:688 Base Elevation: -384 Thickness: 280

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:743 Base Elevation: -439 Thickness: 55
Geologic Description:
Reported Environment: MAINLY SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:743 Base Elevation: -439 Thickness: 335
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:807 Base Elevation: -503 Thickness: 64
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ABNORMALLY THIN INGELARA IN THIS HOLE PROBABLY CAUSED BY FACIES CHANGE.DEPTH TO BASE AND THICKNESS UNCERTAIN

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:811 Base Elevation: -507 Thickness: 4
Geologic Description: INTBDD SST (PARTLY PEBBLY), SLTST, AND SANDY MDST; WAVY IRREGULAR BDG AND BIOTURBATION COMMON.
Reported Environment: RETURN TO MARINE CONDITIONS (TRANSGRESSIVE)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MAY OCCUR AS A VERY THIN UNIT IN THIS HOLE. DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: DEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:811 Base Elevation: -507 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES INGELARA AND FREITAG FMS.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:TD Base Elevation: -926 # Thickness: >419
Geologic Description:
Reported Environment: PRESENCE OF COAL IN LOWER PART OF CATTLE CREEK FM MAY INDICATE INTERTONGUING OR FACIES CHANGE WITH UNDERLYING REIDS DOME BDS (P. 115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -926 ft Thickness: >419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -926 ft Thickness: >822
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BLENHEIM SUB-GR (BLACK ALLEY SH, PEAWADDY FM), GEBBIE SUB-GROUP (INGELARA AND FREITAG FM), TIVERTON SUB-GR (CATTLE CK)

CONTROL POINT: WARRINILLA 1

REFERENCE # B134Y1
REFERENCE # B134Y2
REFERENCE # B134Y3
REFERENCE #.B134X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PLANET EXPL. CO.	RDH, CORED, WIRELINE	SG/55-8	25 06'49"S	148 33'14"E	+306	+311	-1731	2042	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
PLANET EXPLORATION COMPANY PTY. LTD.
WELL COMPLETION REPORT OF WARRINILLA NO.1 (APPLICATION TO PROSPECT NO.100P
PLANET EXPLORATION (COMPANY PTY. LTD. UNPUBL. REPORT (BMR FILE 63/1314)
Page Publn Year: 1963
Cross Reference:

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130
Page TABLE 5 Publn Year: 1973
Cross Reference:

REFERENCE: Y3
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:445 Base Elevation: -134 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:562 Base Elevation: -251 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:562 Base Elevation: -251 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1034 Base Elevation: -723 Thickness: 49

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1083 Base Elevation: -772 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1435 Base Elevation: -1124 Thickness: 352
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X155
Basal Information: Depth to Base:1435 Base Elevation: -1124 Thickness: 352
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:TD Base Elevation: -1731± Thickness: >607
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WARRINILLA NORTH 1

REFERENCE # B130Y1
REFERENCE # B130Y2
REFERENCE # B130Y3
REFERENCE # B130X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PLANET EXPL. CO.	RCH, CORED, WIRELINE	SG/55-4	24 52'49"S	148 31'50"E	+311	+316	-1781	2097	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MEYERS, N.A.
PLANET EXPLORATION COMPANY PTY LTD WELL COMPLETION REPORT WARRINILLA NORTH NO.1
PLANET EXPLORATION COMPANY PTY LTD UNPUBLISHED REPORT (BMR FILE 63/1320)
Page Publn Year: 1963
Cross Reference:

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130
Page Publn Year: 1973
Cross Reference:

REFERENCE: Y3
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:607 Base Elevation: -291 Thickness:)595
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:742 Base Elevation: -426 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:742 Base Elevation: -426 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1253 Base Elevation: -937 Thickness: 30

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1721 Base Elevation: -1405 Thickness: 468
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 304
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X155
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 304
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:TD Base Elevation: -1781* Thickness: >72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:17 Base Elevation: +299 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:519 Base Elevation: -203 Thickness: 502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:810 Base Elevation: -494 Thickness: 291
Geologic Description: GN-GY SILTY MICAC CARB SH, VF-M POORLY SRTD QZOSE FLD TFAC MICAC CARB SST, GY SANDY MICAC CARB SLTST, BLK COAL, RARE ARG LST; INTBDD; CARB FRAGS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	633	-317	2
COAL	651	-335	1.5
COAL INTERVAL	692	-376	15
COAL	714	-398	3

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:810 Base Elevation: -494 Thickness: 291
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:898 Base Elevation: -582 Thickness: 88
Geologic Description: INTBDD DK GY CARB SH AND WH GN GY DR S'TIMES SILIC AND CHERTY TUFF AND TFAC SH CONTAINING FRAGS AND SHARDS VOLC GLASS AND XLS OF BIOT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1014 Base Elevation: -698 Thickness: 116
Geologic Description: LT GY, VF-F QZOSE (WITH FLD AND LI FRAGS) SST (TRACES GLAUC BIOT), DK-M GY MICAC SH, LT-M GY ARG-SHALY SLTST, MINOR FLD TFAC SST; MARINE FOSS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	935	-619	37

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1014 Base Elevation: -698 Thickness: 204
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SHALE AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1052 Base Elevation: -736 Thickness: 38
Geologic Description: LT GY-WH F-M QZOSE SST (IN CLAC KAOL CARB MATRIX) WITH DK GY MICAC CARB SH LAMINAE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1222 Base Elevation: -986 Thickness: 178
Geologic Description: M-DK GY-BR SILTY SH WITH MICAC-CARB LAM SOME GLAUC, M-DK GY-BR ARG CARB SLTST, LT GY-WH F-M QZ-FLD SST WITH CARB SH LAM, RARE DOL LST TF TFAC SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1721 Base Elevation: -1405 Thickness: 499
Geologic Description: INTBDD VF-C OCCAS MICAC CARB SST WITH QZ FLD LI FRAGS, M-DK GY MICAC CARB S'TIMES PY SH, ARG CARB SLTST, PBL-CBL CGL, RARE LST, TF; PLT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:172i Base Elevation: -1405 Thickness: 707
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 304
Geologic Description: M-DK GY-BR ARG CARB (COALY) SLTST, DK GY CARB MICAC SH, VF-C ARG SST WITH QZ FLD LI FRAGS, ARG COQUINOIDAL LST; MARINE AND TRACE FOSS IN SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 304
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 1215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, CEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:TD Base Elevation: -1781 Thickness: 172
Geologic Description: INTBDD GRANULE-CBL CGL (QZ CHERT VOLC METAM FRAGS), F-VC LI SST, M-DK GY AND BLK CARB SH, M-DK GY SANDY TFAC ARG SLTST, PLT FOSS, COAL LAM IN SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y201
Basal Information: Depth to Base:17 Base Elevation: +299 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:628 Base Elevation: -312 Thickness: 611
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:753 Base Elevation: -437 Thickness: 125
Geologic Description:
Reported Environment: TERRESTRIAL - MOSTLY FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:898 Base Elevation: -582 Thickness: 145
Geologic Description:
Reported Environment: RESTRICTED AQUEOUS ENVIRONMENT TRANSITIONAL BETWEEN MARINE AND FRESHWATER CONDITIONS; CONTEMPORANEOUS VOLCANISM (P.55)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1135 Base Elevation: -819 Thickness: 237
Geologic Description:
Reported Environment: MARINE (P.55)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1135 Base Elevation: -819 Thickness: 382
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1173 Base Elevation: -857 Thickness: 38
Geologic Description:

Reported Environment: SHALLOW MARINE (P.46)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1222 Base Elevation: -986 Thickness: 49
Geologic Description:
Reported Environment: DELTAIC MARINE - RELATIVELY DEEP WATER (P.46)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1721 Base Elevation: -1405 Thickness: 499
Geologic Description:
Reported Environment: DELTAIC, PROBABLY PARTLY BRACKISH (P.45)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1721 Base Elevation: -1405 Thickness: 586
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:2026 Base Elevation: -1710 Thickness: 305
Geologic Description:
Reported Environment: MARINE (P.118)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:2026 Base Elevation: -1710 Thickness: 305
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:2626 Base Elevation: -1710 Thickness: 1273
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y214
Basal Information: Depth to Base:TD Base Elevation: -1781? Thickness: >71
Geologic Description:
Reported Environment: DOMINANTLY NON-MARINE (P.32)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:607 Base Elevation: -291 Thickness: 607
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA Fm Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:742 Base Elevation: -426 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:742 Base Elevation: -426 Thickness: 135
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS PERIOD OF WIDESPREAD PALUDAL AND LACUSTRINE CONDITIONS DURING MAJOR REGRESSION IN LATE PERMIAN (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:899 Base Elevation: -583 Thickness: 157
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:1014 Base Elevation: -698 Thickness: 115
Geologic Description:
Reported Environment: MAINLY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:1014 Base Elevation: -698 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:1052 Base Elevation: -736 Thickness: 38
Geologic Description:
Reported Environment: SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:1223 Base Elevation: -907 Thickness: 171
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:1253 Base Elevation: -937 Thickness: 30
Geologic Description:
Reported Environment: TRANSGRESSIVE; DEPOSITION REPRESENTS RETURN TO MARINE CONDITIONS (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:1721 Base Elevation: -1405 Thickness: 468
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS EXTENSIVE REGRESSION; LOWER BEDS MARINE IN PART (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:1721 Base Elevation: -1405 Thickness: 707
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATHERINE SST, INGELARA FM, FREITAG FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 304
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS MAJOR MARINE TRANSGRESSION (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y313
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 304
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y314
Basal Information: Depth to Base:2025 Base Elevation: -1709 Thickness: 1283
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y315
Basal Information: Depth to Base:TD Base Elevation: -1781± Thickness: >72
Geologic Description:
Reported Environment: DEPOSITED DURING INITIAL SUBSIDENCE OF DENISON TROUGH (P.114)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YANDINA 1

REFERENCE # D110Y1
REFERENCE # D110Y2
REFERENCE # D110X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC FRENEY OIL	RDH+WIRELINE UNCORED	SG/55-3	24 11'00"S	148 30'00"E	+201	+206	-574	788	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
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REPORT NO. Q/55-56P/246 (UNPUBL)
Page Publn Year: 1965
Cross Reference: MOL M, R.G. ET AL.,1969, BMR REPORT 123

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DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 130
Page 116; TBL 5 Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SOUTH-WEST

STRATIGRAPHY: REWAN GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:67 Base Elevation: +139 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:125 Base Elevation: +81 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:125 Base Elevation: +81 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:424 Base Elevation: -218 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. ¼" USE USED FOR CONTOUR MAPPING

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:706 Base Elevation: -500 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:TD Base Elevation: -574% Thickness: >74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP ELEVATION -500 M. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:67 Base Elevation: +139 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:226 Base Elevation: -20 Thickness: 159
Geologic Description: INTBDD SST, SLTST AND SH; INCREASINGLY CALC TOWARDS BASE; BASE CHARACTERISED BY SANDSTONES AND THIN COAL SEAMS
Reported Environment: SLOW DEPOSITION IN PROTECTED PARALIC BASINS; TRANSITIONAL FROM MARINE TO FRESHWATER (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	675	-469	1
COAL; 2 SEAMS	740	-534	3

Tectonic Structure:
Remarks EQUIVALENT TO BANDANNA FM OF REFERENCE REPORT

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:633 Base Elevation: -427 Thickness: 407
Geologic Description: INTBDD SLTST, SST AND SH. NUMEROUS THIN DIRTY COAL SEAMS IN UPPER SEQUENCE. UNIT IS MORE SANDY TOWARDS TOP AND MORE SILTY TOWARDS BASE
Reported Environment: DEPOSITION IN EXTENSIVE SHALLOW BASIN VARYING FROM NORMAL MARINE TO RESTRICTED BRACKISH WATER (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	244	-38	18
COAL INTERVAL	258	-52	20
COAL INTERVAL	419	-213	116
LIMESTONE	475	-269	3

Tectonic Structure:
Remarks EQUIVALENT TO DRY CREEK SHALE OF REFERENCE REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:633 Base Elevation: -427 Thickness: 566
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:659 Base Elevation: -453 Thickness: 26
Geologic Description: WELL DEVELOPED SST AT TOP FOLLOWED BY INTBDD DIRTY SST AND CARB SILTSTONE AND BASAL SST
Reported Environment: SHALLOW MARINE TO PARALIC; POSSIBLY POORLY DEVELOPED SAND BARS (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO EARLY STORMS SST OF REFERENCE REPORT

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:700 Base Elevation: -494 Thickness: 41
Geologic Description: SHALY SILTSTONE, SANDY IN MIDDLE; BLACK CARBONACEOUS AND SLIGHTLY CALCAREOUS. MINOR WHITE SHALE WITH BROWN NODULES
Reported Environment: RAPID DEPOSITION IN RESTRICTED MARINE CONDITIONS (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -574 ± Thickness:)80
Geologic Description: SST WITH MINOR CARB SLTST AND WHITE TO BROWN SHALE
Reported Environment: BRACKISH DELTAIC SEDIMENTATION; PROGRADATION OF DELTAIC SANDS ALTERNATED WITH SLOW SILTY DEPOSITION (MOLLAN ET AL. 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -574 ± Thickness:)147
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -574 ± Thickness:)713
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND GEBBIE SUB-GROUPS AS ABOVE

STRATIGRAPHY: UNDIFF POST-TRIASSIC Age: POST-TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:67 Base Elevation: +139 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:125 Base Elevation: +81 Thickness: 58
Geologic Description:
Reported Environment: FLUVIAL, PALUDAL AND LACUSTRINE. COAL MEASURES DEPOSITED IN AN EXTENSIVE SYSTEM OF SWAMPS AND SLUGGISH RIVERS
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:182 Base Elevation: +24 Thickness: 58
Geologic Description:
Reported Environment: COLD BRACKISH WATER WITH EUXINIC CONDITIONS. TRANSITIONAL FROM MARINE TO FRESHWATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:424 Base Elevation: -218 Thickness: 241
Geologic Description:
Reported Environment: MARINE AND AT TIMES BRACKISH DELTA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks "GERMAN CREEK CM" EQUIVALENT TO MACMILLAN FM + GERMAN CREEK FM + CROCKER FM

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:631 Base Elevation: -425 Thickness: 207
Geologic Description:
Reported Environment: MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:631 Base Elevation: -425 Thickness: 506
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH, GERMAN CREEK CM AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:640 Base Elevation: -434 Thickness: 9
Geologic Description:
Reported Environment: SHALLOW MARINE WITH CONSIDERABLE REWORKING OF SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:698 Base Elevation: -492 Thickness: 58
Geologic Description:
Reported Environment: RELATIVELY DEEP MARINE WITH EUXINIC CONDITIONS AND LITTLE EFFECTIVE REWORKING OF SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -574 ± Thickness:)82

Geologic Description:
Reported Environment: DELTAIC AND PARTLY BRACKISH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:TD Base Elevation: -574 ft Thickness:)149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST, INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -574 ft Thickness:)655
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND GEBBIE SUB-GROUPS AS ABOVE

BOWEN

BASIN

SUB-SURAT

CONTROL POINT: ALTON 1

REFERENCE # T40 Y1
REFERENCE # T40 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/55-16	27 56'18"S	149 22'18"E	+217	+221	-2013	2234	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
HERRMANN, F.A., AND CAREY, A.R.
WELL COMPLETION REPORT NO.31, UNION-KERN-A.O.G. ALTON NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 64/4053
Page Publn Year: 1964
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SUPAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2088 Base Elevation: -1867 Thickness: 2084
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2153 Base Elevation: -1932 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF BLENHEIM S-GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2173 Base Elevation: -1952 Thickness: 20
Geologic Description: GRADES UP INTO BLACKWATER GP
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2201 Base Elevation: -1980 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2201 Base Elevation: -1980 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFF BLENHEIM SUB-GP & NUGGLETON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2201 Base Elevation: -1980 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2013# Thickness: >33
Geologic Description: VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:817 Base Elevation: -596 Thickness: 813
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-CUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1497 Base Elevation: -1276 Thickness: 680
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO CUBBERAMUNDA SST

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1662 Base Elevation: -1441 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1811 Base Elevation: -1590 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN-WANDOAN Age: TRIASSIC-JUR Interp etation Code:Y105
Basal Information: Depth to Base:2089 Base Elevation: -1868 Thickness: 278

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED EVERGREEN FM, PRECIPICE SST & WANDOAN FM

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:2152 Base Elevation: -1931 Thickness: 63
Geologic Description: INTBDD COAL, WH TUFF & CR M GRAINED TIGHT SST COMPOSED OF REWORKED GRAINS OF TUFF IN A WHITE TUFFACEOUS CLAY MATRIX
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	2107	-1886	10 CA
COAL	2118	-1897	2 CA
COAL	2132	-1911	3 CA
CAOL INTERVAL	2148	-1927	6 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2203 Base Elevation: -1982 Thickness: 51
Geologic Description: LT GY CALC SLTST (MARINE FOSSILS), GY-BR CARB SH, WH TUFF, CREAM TFAC SST, THIN COAL BEDS, LT GY COARSE-GRANULAR SL CALC SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -2013$ Thickness:)31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: APPLE TREE 1

REFERENCE # T23 Y1
REFERENCE # T23 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST RES	RDH, WIRELINE	SG/55-12	26 54'17"S	149 16'03"E	+277	+282	-2061	2343	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1

GROVES, R.D., AND BROWN, L.N. (MINES ADMINISTRATION)
WELL COMPLETION REPORT A.A.R. APPLE TREE NO.1, A.A.R. SILVER VALLEY NO.1
UNPUBLISHED COMPANY REPORT NO.Q/119P/566. BMR FILE 73/261

Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1623 Base Elevation: -1341 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2083 Base Elevation: -1801 Thickness: 460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2185 Base Elevation: -1903 Thickness: 102
Geologic Description: 20.7% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2185 Base Elevation: -1903 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2227 Base Elevation: -1945 Thickness: 42
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2292 Base Elevation: -2010 Thickness: 65
Geologic Description: 21.1% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2327 Base Elevation: -2045 Thickness: 35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2327 Base Elevation: -2045 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SHALE, TINOWON FM & MUGGLETON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:2327 Base Elevation: -2045 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:TD Base Elevation: -2061± Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:267 Base Elevation: -15 Thickness: 262
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:402 Base Elevation: -120 Thickness: 135

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOOGA SST Age: CRETACEOUS Interpretation Code:Y103
Basal Information: Depth to Base:524 Base Elevation: -242 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ORALLO FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:695 Base Elevation: -413 Thickness: 171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUBBERAMUNDA SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:821 Base Elevation: -539 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1270 Base Elevation: -988 Thickness: 449
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1507 Base Elevation: -1225 Thickness: 237
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1608 Base Elevation: -1326 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1623 Base Elevation: -1341 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:1674 Base Elevation: -1592 Thickness: 251
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOWGROUNDS SST Age: TRIASSIC Interpretation Code:Y111
Basal Information: Depth to Base:1683 Base Elevation: -1601 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y112
Basal Information: Depth to Base:2083 Base Elevation: -1801 Thickness: 200
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:2167 Base Elevation: -1885 Thickness: 84
Geologic Description: DK GR V CARB SH-DULL BLK COAL, WH TFAC SH (LOWER PART), GY-BR QZOSE SL FLD LI CARB SLTST, GY HARD M-C QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 2100 -1818 18 CA
COAL INTERVAL 2121 -1839 9 CA
COAL INTERVAL 2147 -1865 17 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:2167 Base Elevation: -1885 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:2192 Base Elevation: -1918 Thickness: 25
Geologic Description: LT GY HARD FINELY CARB SLTST & SH ABOVE COAL, SOFTER SLTST & SH (CARB LAM) BELOW COAL, WH TFAC BANDS, DK BR CARB SH-DULL BLK COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
WINNATHOOLA COAL MB	2185	-1983	7

Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:2275 Base Elevation: -1993 Thickness: 83
Geologic Description: GY SL FLD PY QZOSE SLTST, GY NON-FOS QZOSE SL PY SLTST, DK GY-DR CARB SLTST & SH-DULL BLK SHALY COAL, GY-BR F-C QZOSE LI FLD SST, VF-F QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	2224	-1942	32
WALLABELLA COAL MB	2265	-1983	28

Tectonic Structure:
Remarks SHELL FRAGMENTS & SPINES IN LOWER PART OF MANTUAN PRODUCTUS BED

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:Y118
Basal Information: Depth to Base:2327 Base Elevation: -2045 Thickness: 52
Geologic Description: DK GY QZOSE SL FLD CARB MICAC PY SLTST, DK GY HARD SILTY PY VAR CARB SH, GY M-C MOD WELL SRTD SL MICAC & PY QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LORELLE SST MB	2327	-2045	35

Tectonic Structure:
Remarks GRADATIONAL BOUNDARY AT TOP

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y119
Basal Information: Depth to Base:2327 Base Elevation: -2045 Thickness: 160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH, TINOWON FM & MUGGLETON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:2327 Base Elevation: -2045 Thickness: 160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY: ROMA GRANITE Age: CARBONIFEROUS Interpretation Code:Y121
Basal Information: Depth to Base:TD Base Elevation: -2061? Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

CONTROL POINT: ARBROATH 1

REFERENCE # T19 Y1
REFERENCE # T19 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORE + WIRELINE	SG/55-11	26 41'80"S	148 26'00"E	+352	+357	-2193	2550	?

REFERENCE: X1
THIS REPORT
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Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.A.O. ARBROATH NO.1 WELL, QUEENSLAND, WELL COMPLETION REPORT
ASSOCIATED AUSTRALIAN OILFIELDS UNPUBLISHED REPORT. BMR FILE 63/1205
Page
Publn Year: 1963
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1401 Base Elevation: -1044 Thickness: 1396
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2522 Base Elevation: -2165 Thickness: 1121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -2193# Thickness:)28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:322 Base Elevation: +35 Thickness: 317
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:433 Base Elevation: -76 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED TRANSITION MEMBER OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: MOOGA SST Age: CRETACEOUS Interpretation Code:Y103
Basal Information: Depth to Base:519 Base Elevation: -162 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ORALLO FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:660 Base Elevation: -303 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED FOSSILWOOD MEMBER OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: GUBBERAMUNDA SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:745 Base Elevation: -388 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1066 Base Elevation: -709 Thickness: 321
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1260 Base Elevation: -903 Thickness: 194
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1359 Base Elevation: -1002 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1401 Base Elevation: -1044 Thickness: 42

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y119
Basal Information: Depth to Base:2522 Base Elevation: -2165 Thickness: 1121
Geologic Description: SH WITH CGL INTBDS; SLTST WITH SST & SH INTBDS; SLTST-SH WITH MINOR SST; CARB SH, SLTST, COAL; PREDOM CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 2459 -2093 11
Tectonic Structure:
Remarks CALLED UNIT 8 IN W.C.R. DIVIDED INTO FIVE INFORMAL SUB-UNITS (AS ABOVE)

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -2193+ Thickness: >28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BOOBERANNA 1

REFERENCE # T45 Y1
REFERENCE # T45 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/55-4	28 27'54"S	149 48'29"E	+192	+196	-2249	2445	?

REFERENCE: X1

THIS REPORT

Page

Publn Year:

Cross Reference:

REFERENCE: Y1

PYLE, D.E.
WELL COMPLETION REPORT, UNION-KERN-A.O.G. BOOBERANNA NO.1
UNION OIL DEVELOPMENT CORPORATION UNPUBLISHED REPORT

Page

Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2176 Base Elevation: -1980 Thickness: 2172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2233 Base Elevation: -2037 Thickness: 57
Geologic Description: 27% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2400 Base Elevation: -2204 Thickness: 167
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -2249# Thickness:)45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:862 Base Elevation: -666 Thickness: 858
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1466 Base Elevation: -1270 Thickness: 604
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM-GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1628 Base Elevation: -1432 Thickness: 162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1958 Base Elevation: -1762 Thickness: 330
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HUTTON SST-PRECIPICE SST

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:2178 Base Elevation: -1982 Thickness: 220
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:2256 Base Elevation: -2060 Thickness: 78
Geologic Description: C QZ-LI SST, WH-BR GY F-M SST, LT GY VF-F SST, WH-LT GY SOFT ASH & TUFF, BR-GY SLTST, GY MICAC CARB SLTST, GY-BLK CARB + LT-DK GY SH, BLK COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2179	-1983	1 CA
COAL	2218	-2022	1 CA
COAL	2222	-2026	1 CA

Tectonic Structure:
Remarks THINNER ((1 M) COAL SEAMS ALSO PRESENT

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2400 Base Elevation: -2204 Thickness: 144
Geologic Description: GY-BR MICAC ARG PARTLY CARB SLTST, M-DK GY & BR-GY SILTY PARTLY BENT SHALE WITH GY VF-M QZ-LI TFAC SST, WH-CR BENT ASH, MINOR LST, TRACE COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y169
Basal Information: Depth to Base:TD Base Elevation: -2249# Thickness:)45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2179	-1983	1 CA
COAL	2210	-2022	1 CA
COAL	2222	-2026	1 CA

Tectonic Structure:
Remarks

CONTROL POINT: BOORDONDOO 1

REFERENCE # T36

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 52'20"S	150 21'23"E	+268	+272	-1506	1778	

REFERENCE: MACK, J.E.
SUBSURFACE GEOLOGY OF THE CROWDER-WEIR TREND, AUTHORITY TO PROSPECT 57P, QUEENSLAND, AUSTRALIA
UNION OIL DEVELOPMENT CORP. G.R. NO.13 (UNPUBLISHED). BMR FILE 63/1316 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:361 Base Elevation: -89 Thickness: 357
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1012 Base Elevation: -740 Thickness: 651
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN REFERENCE. REPRESENTS BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1296 Base Elevation: -1026 Thickness: 286
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1506 Base Elevation: -1234 Thickness: 208
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1632 Base Elevation: -1360 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:1719 Base Elevation: -1447 Thickness: 87

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1508' Thickness: >59
Geologic Description: DARK GREY MICROMICACEOUS SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SPORES (1777-1778 M) INDICATE LOWER PERMIAN AGE; EQUIV WITH EITHER CATTLE CK FM OR REIDS DOME BEDS

CONTROL POINT: BURUNGA 1

REFERENCE # T16 Y1
REFERENCE # T16 Y2
REFERENCE # T16 Y3
REFERENCE # T16 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORED, WIRELINE	SG/56-5	26 00'00"S	150 04'43"E	327	333	-2789	3122	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
UNION OIL DEVELOPMENT CORPORATION
WELL COMPLETION REPORT NO. 6 UNION-KERN-A.O.G. BURUNGA NO. 1
UNION OIL DEVELOPMENT CORPORATION UNPUBL. REPORT (BMR FILE 62/1107) Page Publn Year: 1962
Cross Reference: BUREAU OF MINERAL RESOURCES, AUSTRALIA, PETROLEUM SEARCH SUBSIDY ACTS PUB. NO. 5 3, 1964

REFERENCE: Y2
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130 Page Publn Year: 1973
Cross Reference:

REFERENCE: Y3
RUNNEGAR, B.N.
THE PERMIAN FAUNAS OF NORTHERN NEW SOUTH WALES AND THE CONNECTION BETWEEN THE SYDNEY AND BOWEN BASINS
JOURNAL OF THE GEOLOGICAL SOCIETY OF AUSTRALIA, VOL 16(2) Page 697-710 Publn Year: 1970
Cross Reference: BUREAU OF MINERAL RESOURCES, AUSTRALIA, PETROLEUM SEARCH SUBSIDY ACTS PUB. NO. 5 3, 1964.

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:614 Base Elevation: -281 Thickness: 608
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:630 Base Elevation: -297 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: "PRODUCTIVE MB" Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1181 Base Elevation: -848 Thickness: 551
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks "PRODUCTIVE MB" IS BARALABA CM ABOVE KALDOLA TUFF MB

STRATIGRAPHY: KALOOLA TUFF MB Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1419 Base Elevation: -1086 Thickness: 239
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF BARALABA CM

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1419 Base Elevation: -1086 Thickness: 789
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS "PRODUCTIVE MB" AND KALOOLA TUFF MB

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2003 Base Elevation: -1670 Thickness: 584
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2003 Base Elevation: -1670 Thickness: 1373
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM ("PRODUCTIVE MB" AND KALOOLA TUFF MB) AND GYRANDA FM

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2812 Base Elevation: -2479 Thickness: 809
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2812 Base Elevation: -2479 Thickness: 809
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:2993 Base Elevation: -2660 Thickness: 181
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:TD Base Elevation: -2789# Thickness: >129
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:619 Base Elevation: -286 Thickness: 614
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:635 Base Elevation: -302 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1419 Base Elevation: -1086 Thickness: 784
Geologic Description: INTBDD TFAC CARB SH, TFAC SST, TFAC SST, TFAC CGL, THIN COAL BDS, WH TUFF, CARB SH AND SLTST
Reported Environment: NON-MARINE (P. 3)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	35	-402	61
COAL INTERVAL	488	-655	198
COAL INTERVAL	1113	-780	88
COAL INTERVAL	1231	-898	101

Tectonic Structure:
Remarks: CALLED KIANGA FM IN REPORT; GAS SHOWS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:2987 Base Elevation: -2654 Thickness: 1568
Geologic Description: TFAC SH AND SLTST, THIN COAL SEAMS, MINOR QZOSE TFAC SST, TFAC CGL AND C SST AND WH SIL TUFF
Reported Environment: SHALLOW MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1640	-1307	67
COAL INTERVAL	1771	-1438	94
COAL INTERVAL	2832	-2499	18
COAL INTERVAL	2950	-2617	73

Tectonic Structure:
Remarks: GAS SHOWS

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -2789# Thickness: >135
Geologic Description: INTBDD RHY-ANDES WELDED TUFF AND ANDESITE FLOWS
Reported Environment: TERRESTRIAL

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CRACOW FM IN REPORT; GAS SHOWS

STRATIGRAPHY: UNDIFF POST-TRIASSIC Age: POST-TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:619 Base Elevation: -286 Thickness: 614
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:634 Base Elevation: -301 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1419 Base Elevation: -1086 Thickness: 785
Geologic Description:
Reported Environment: FLUVIAL LACUSTRINE OR PALUDAL (P.126)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:2920 Base Elevation: -2587 Thickness: 1501
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUFFEL FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:2987 Base Elevation: -2654 Thickness: 67
Geologic Description:
Reported Environment: SHALLOW MARINE (P.37)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:2987 Base Elevation: -2654 Thickness: 67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BUFFEL FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y207

Basal Information: Depth to Base:2987 Base Elevation: -2654 Thickness: 1568
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED BLENHEIM SUB-GROUP AND BUFFEL FM OF TIVERTON SUB-GROUP

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:3042 Base Elevation: -2709 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -2789± Thickness:)80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: TRIASSIC Interpretation Code:Y301
Basal Information: Depth to Base:854 Base Elevation: -521 Thickness: 848
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE IS TRIASSIC

STRATIGRAPHY: "PRODUCTIVE MB" Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:1185 Base Elevation: -852 Thickness: 331
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks "PRODUCTIVE MB" IS BARALABA CM ABOVE THE KALOOLA TUFF MEMBER. UNIT NOT DEFINED IN REFERENCE REPORT

STRATIGRAPHY: KALOOLA TUFF MB Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:1276 Base Elevation: -943 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF BARALABA CM

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:1276 Base Elevation: -943 Thickness: 422
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS "PRODUCTIVE MB" AND KALOOLA TUFF MB

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:1414 Base Elevation: -1081 Thickness: 138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:1414 Base Elevation: -1081 Thickness: 560
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM ("PRODUCTIVE MB" AND KALOOLA TUFF MB) AND GYRANDA FM

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:2914 Base Elevation: -2581 Thickness: 1500
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REFERENCE ASCRIBES TO OXTRACK AND FLAT TOP FMS BUT DOES NOT DEFINE THEIR BOUNDARIES.

STRATIGRAPHY: BUFFEL FM Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:2982 Base Elevation: -2649 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:2982 Base Elevation: -2649 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BUFFEL FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:2982 Base Elevation: -2649 Thickness: 1568
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM AND TIVERTON (BUFFEL FM) SUB-GROUP.

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:TD Base Elevation: -2789* Thickness: >140
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CABAWIN 1

REFERENCE # T33 Y1
REFERENCE # T33 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RCH, CORE + WIRELINE	SG/56-13	27 29'46"S	150 11'22"E	+298	+295	-3373	3668	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
KELLER, A.S., AND MCGARRY, D.J.
WELL COMPLETION REPORT NO.1, UNION-KERN-A.O.G. CABAWIN NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 62/1662
Page Publn Year: 1961
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X1f1
Basal Information: Depth to Base:18 Base Elevation: +277 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:2329 Base Elevation: -2034 Thickness: 2311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CABAWIN FM Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:2998 Base Elevation: -2703 Thickness: 669
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:3135 Base Elevation: -2840 Thickness: 137
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:3135 Base Elevation: -2840 Thickness: 137
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDAHNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3158 Base Elevation: -2863 Thickness: 23
Geologic Description: CONTAINS FAUNA IV
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3280 Base Elevation: -2985 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:3280 Base Elevation: -2985 Thickness: 145
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH & TINOWON FM

STRATIGRAPHY: UNDIFF BACK CREEK GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:3523 Base Elevation: -3228 Thickness: 243
Geologic Description: CONTAINS FAUNA II
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:3523 Base Elevation: -3228 Thickness: 388
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH, TINOWON FM & UNDIFF BACK CREEK GP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:TD Base Elevation: -3373# Thickness: >145
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:18 Base Elevation: +277 Thickness: 13

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:873 Base Elevation: -578 Thickness: 855
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN W.C.R.

STRATIGRAPHY: BUNGIL-CUBBERAMUNDA Age JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:1280 [illegible] Elevation: -985 Thickness: 407
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO CUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1659 Base Elevation: -1364 Thickness: 379
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:2329 Base Elevation: -2034 Thickness: 670
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BUNDAMBA FM IN W.C.R. REPRESENTS UNDIFFERENTIATED HUTTON SST-PRECIPICE SST

STRATIGRAPHY: CABAWIN FM Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:2998 Base Elevation: -2703 Thickness: 669
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:3157 Base Elevation: -2862 Thickness: 159
Geologic Description: INTBDD MICAC CARB TUFF, COAL, LOCALLY QZOSE, GENERALLY VOLC LITHIC & SILICEOUS SST & MINOR CONGLOMERATE (ASH PEBBLES IN ASH MATRIX)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAMS T'OUT
Tectonic Structure:

Remarks UPPER PERMIAN AGE FROM SPORES

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y16B
Basal Information: Depth to Base:3555 Base Elevation: -3260 Thickness: 398
Geologic Description: CALC SLTST INTBDD WITH CALC SH & SST (FOSSILIFEROUS); INTBDD COAL & SST; DK GY PY SILTY SH, TFAC SST & SLTST, TUFF
Reported Environment: SHALLOW WATER MARINE - ESTUARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	3269	-2974	53

Tectonic Structure:
Remarks PERMIAN AGE FROM MACROFOSSILS. FOSSILS INCLUDE BRACHIOPODS & CRINOIDS. COAL INTERVAL - TONGUE OF OVERLYING BLACKWATER G

STRATIGRAPHY: CRACOW FM Age: CARB-PERMIAN Interpretation Code:Y18D
Basal Information: Depth to Base:TD Base Elevation: -3373# Thickness: >113
Geologic Description: ANDESITIC-DACITIC VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

CONTROL POINT: COCKATOO CREEK 1

REFERENCE # T14 Y1
REFERENCE # T14 X1
REFERENCE # T14 Y2
REFERENCE # T14 Y3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORED, WIRELINE	SG/56-5	25 34'16"S	150 06'00"E	290	205	-3478	3683	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
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WELL COMPLETION REPORT NO. 12 UNION-KERN-A.O.G. COCKATOO CREEK NO.1
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DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130
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Cross Reference:

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GRAY, A.R.G., AND HEYWOOD, P.B.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA BETWEEN COCKATOO CREEK AND MOURA
QUEENSLAND GOVERNMENT MINING JOURNAL, 79
Page 651-664 Publn Year: 1978
Cross Reference: MOLLAN R.G. ET AL. 1972 BMR REPORT NO.142

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:220 Base Elevation: -15 Thickness: 215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1009 Base Elevation: -804 Thickness: 789
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: "PRODUCTIVE MB" Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1551 Base Elevation: -1346 Thickness: 542
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: REPRESENTS BARALABA CM ABOVE THE KALOOLA MEMBER

STRATIGRAPHY: KALOOLA TUFF MB Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1676 Base Elevation: -1471 Thickness: 125

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BELONGS TO BARALABA CM

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1676 Base Elevation: -1471 Thickness: 667
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS "PRODUCTIVE MB" AND KALOOLA MB

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2382 Base Elevation: -2177 Thickness: 706
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2382 Base Elevation: -2177 Thickness: 1373
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM ("PRODUCTIVE MB" + KALOOLA MB) AND GYRANDA FM

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2890 Base Elevation: -2685 Thickness: 508
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 743
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:3669 Base Elevation: -3464 Thickness: 36
Geologic Description: SHALE, SLTST, WH-GY-GN TUFF. (NO LST TYPICAL OF OXTRACK FM).
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY EQUIVALENT TO "PINDARI FM" OF FLOOD, JELL & WATERHOUSE (1981).

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:3669 Base Elevation: -3464 Thickness: 1287
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD AND OXTRACK FMS.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:3669 Base Elevation: -3464 Thickness: 1287
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FLAT TOP, BARFIELD AND OXTRACK FMS OF BLENHEIM SUB-GP.

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:TD Base Elevation: -3478* Thickness: >14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:201 Base Elevation: +4 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:1009 Base Elevation: -804 Thickness: 808
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "CABAWIN FM" IN COMPLETION REPORT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1701 Base Elevation: -1496 Thickness: 693
Geologic Description: INTBDD COAL, WH TFAC SST AND SLTST AND GY-WH TUFF AND SH
Reported Environment: NON-MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1065	-868	53
COAL INTERVAL	1210	-1005	94
COAL INTERVAL	1448	-1243	213
COAL INTERVAL	1548	-1343	30

Tectonic Structure:
Remarks CALLED "KIANGA FM" IN COMPLETION REPORT

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104

Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 1931
Geologic Description: MONOTONOUS SEQ OF SILIC CARB SLTST, TFAC CARB SH, TUFF AND MINOR TFAC SST; MEGAFOSSILS EXTREMELY RARE
Reported Environment: SHALLOW WATER MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2752	-2547	82
COAL INTERVAL	2835	-2630	76
COAL INTERVAL	2929	-2724	43
COAL	3021	-2816	3

Tectonic Structure:
Remarks

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -3478* Thickness:)164
Geologic Description: WH-GN TUFF AND A REDDISH-BR, PINK, GN VOLC FLOW
Reported Environment: TERRESTRIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "CRACOW FM" IN COMPLETION REPORT

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:221 Base Elevation: -16 Thickness: 216
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1010 Base Elevation: -805 Thickness: 789
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1705 Base Elevation: -1500 Thickness: 695
Geologic Description:
Reported Environment: FLUVIAL, LACUSTRINE OR PALUDAL (P.126)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:3450 Base Elevation: -3245 Thickness: 1745
Geologic Description:
Reported Environment: DEEP MARINE TO FRESHWATER (P.54)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUFFEL FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 183
Geologic Description:

Reported Environment: COLD SHALLOW MARINE (P.37)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 183
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTED BY BUFFEL FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 1927
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED BLENHEIM SUB-GROUP AND BUFFEL FM OF TIVERTON SUB-GROUP

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -3478* Thickness:)56
Geologic Description:
Reported Environment: TERRESTRIAL (P.36)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:1647 Base Elevation: -1442 Thickness: 1642
Geologic Description:
Reported Environment: FRESHWATER SWAMPS; PALUDAL, FLUVIAL (HOLLAN ET AL. 1972, P.14,29)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:2382 Base Elevation: -2177 Thickness: 735
Geologic Description:
Reported Environment: BRACKISH TO FRESH-WATER (P.659) FLUVIAL OR DELTAIC (HOLLAN ET AL. 1972, P.28)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:2382 Base Elevation: -2177 Thickness: 2377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM AND GYRANDA FM

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:2890 Base Elevation: -2685 Thickness: 508
Geologic Description:
Reported Environment: NEARSHORE MARINE (P.658)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:3600 Base Elevation: -3395 Thickness: 710
Geologic Description:
Reported Environment: SHALLOW-WATER MARINE (P.657)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:3604 Base Elevation: -3399 Thickness: 4
Geologic Description:
Reported Environment: SHALLOW MARINE WITH FLUCTUATING ENERGY (P.656)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:3604 Base Elevation: -3399 Thickness: 1957
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD, AND OXTRACK FMS

STRATIGRAPHY: BUFFEL FM Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 29
Geologic Description:
Reported Environment: SHALLOW MARINE (MOLLAN ET AL. 1972, P.15)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BUFFEL FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:3633 Base Elevation: -3428 Thickness: 1986
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks FLAT TOP, BARFIELD, OXTRACK FM OF BLEMHEIM SUB-GR; BUFFEL FM OF TIVERTON SUB-GROUP

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:TD Base Elevation: -3478' Thickness:)50
Geologic Description:
Reported Environment: TERRESTRIAL IN PART (P.653) SHALLOW MARINE (MOLLAN ET AL. 1972, P.15)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: COMBARNGO 1

REFERENCE # T22 X1
REFERENCE # T22 Y1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDN, CORE + WIRELINE	SG/55-12	26 51'00"S	149 09'00"E	+280	+283	-1541	1824	?

REFERENCE: X1

THIS REPORT

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Publn Year:

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BUREAU OF MINERAL RESOURCES
A.A.O. COMBARNGO NO. 1, QUEENSLAND, OF ASSOCIATED AUSTRALIAN OILFIELDS N.L.
PETROLEUM SEARCH SUBSIDY ACTS PUBLICATION SI

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Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET. Interpretation Code: X101
Basal Information: Depth to Base: 1326 Base Elevation: -1043 Thickness: 1323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code: X102
Basal Information: Depth to Base: 1550 Base Elevation: -1267 Thickness: 224
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code: X103
Basal Information: Depth to Base: 1625 Base Elevation: -1342 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code: X104
Basal Information: Depth to Base: 1715 Base Elevation: -1432 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code: X105
Basal Information: Depth to Base: 1715 Base Elevation: -1432 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: VOLCANICS Age: ? Interpretation Code:X186
Basal Information: Depth to Base:TD Base Elevation: -1541# Thickness:)109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:294 Base Elevation: -11 Thickness: 291
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ROMA FM OF W.C.R.

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:391 Base Elevation: -108 Thickness: 97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED TRANSITION MB OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: HOOGA SST Age: CRETACEOUS Interpretation Code:Y103
Basal Information: Depth to Base:434 Base Elevation: -151 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickne
Tectonic Structure:
Remarks CALLED HOOGA MB OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: ORALLO FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:576 Base Elevation: -293 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED FOSSIL WOOD MB OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: GUBBERAMUNDA SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:675 Base Elevation: -392 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED GUBBERAMUNDA MB OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1131 Base Elevation: -848 Thickness: 456

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1326 Base Elevation: -1043 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BUNDAMBA GP OF W.C.R. REPRESENTS UNDIFFERENTIATED HUTTON SST TO PRECIPICE SST

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1550 Base Elevation: -1267 Thickness: 224
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1620 Base Elevation: -1337 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PICKANJINNIE FM OF W.C.R.

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1715 Base Elevation: -1432 Thickness: 95
Geologic Description: INTERBEDDED SANDSTONE, SILTSTONE, SHALE, MUDSTONE WITH A NUMBER OF COAL SEAMS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LATEMORE FM OF W.C.R.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1715 Base Elevation: -1432 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: VOLCANICS Age: ? Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1541# Thickness:)109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CRYSTALBROOK 1

REFERENCE # T3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PLANET EXPL. CO.	RDH, CORED, WIRELINE	SG/55-7	25 29'03"S	147 59'35"E	+502	+505	-123	628	

REFERENCE: MEYERS, N.A. FOR PLANET OIL COMPANY N.L.
PLANET CRYSTALBROOK NO. 1, A TO P &1P QUEENSLAND, COMPLETION REPORT
PLANET EXPLORATION COMPANY PTY LTD UNPUBL. REPORT BMR FILE 64/4055 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:570 Base Elevation: -651 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:291 Base Elevation: +214 Thickness: 288
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:609 Base Elevation: -104 Thickness: 318
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -123 # Thickness:)19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: D.R.D. 6

REFERENCE # T15

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/56-5	25 40'55"S	150 06'45"E		CA 200	-114	314	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC DRILLING IN THE SURAT AND BOWEN BASINS, 1965-1966
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 22 Page 2,10,11,22 Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:43 Base Elevation: +157 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to base:218 Base Elevation: -18 Thickness: 175
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:310 Base Elevation: -110 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -114 # Thickness:)4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: EDDYSTONE 1

REFERENCE # T2 Y1
REFERENCE # T2 Y2
REFERENCE # T2 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH CORED WIRELINED	SG/55-7	25 20'00"S	148 18'00"E	+539	+541	-679	1220	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
HEYWOOD, P.B.
STRATIGRAPHIC DRILLING REPORT - GSQ EDDYSTONE 1
QUEENSLAND GOVERNMENT MINING JOURNAL, 79
Page 407-417 Publn Year: 1978
Cross Reference: MCKELLAR J.L. 1978, QMJ 79, 424-434 MCCLUNG G. 1978, QMJ 79, 420-423

REFERENCE: Y2
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:340 Base Elevation: +201 Thickness: 215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:441 Base Elevation: +100 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:441 Base Elevation: +100 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:831 Base Elevation: -290 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:924 Base Elevation: -383 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:961 Base Elevation: -420 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X155
Basal Information: Depth to Base:961 Base Elevation: -420 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:TD Base Elevation: -679% Thickness:)259
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:125 Base Elevation: +416 Thickness: 125
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:340 Base Elevation: +201 Thickness: 215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:441 Base Elevation: +100 Thickness: 101
Geologic Description: INTBDD LT GY VF-M SUBLAB-LAB MICAC SST, GY-DK GY SLTST, GY-DK GY SILTY CARB MDST AND SH, TFAC MDST, COAL; SST LAM-MASS XBDD; CARB FRAGS PLT FOSS
Reported Environment: PALUDAL
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
COAL INT (5 SEAMS) 391 +158 49
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY - UPPER STAGE 5 (U5) (MCKELLAR 1978, P.429)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:441 Base Elevation: +130 Thickness: 181
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:597 Base Elevation: -56 Thickness: 156
Geologic Description: DK CY-BLK MICAC PY SH (SID AND CALC LAM) WITH INTBDD GY-DK GY MICAC SLTST, VF-F SILTY LAB SST, BENTONITIC SILTY CALC TUFF; BDG LAMD; PLT FOSS
Reported Environment: PARALIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:652 Base Elevation: -111 Thickness: 55
Geologic Description: LT-DK GY SANDY CALC PY TFAC MICAC SLIST AND LESSER LT GY F SILTY LAB CALC MICAC SST AND SILTY CALC TUFF; SLTST BIOTURB, SST THICK BDD; SHELLS
Reported Environment: SHALLOW WATER MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY - UPPER STAGE 5 (P3C ACRITARCH ZONE) (MCKELLAR 1978 P.429)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:652 Base Elevation: -111 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:770 Base Elevation: -229 Thickness: 118
Geologic Description: DK GY SHALY SANDY COQ PBLY MICAC SLIST, SILTY COQUINITE, DK GY SILTY MICAC PY SH, MINOR PBLY CGL SST AND SILTY TF; BIOTURB; MARINE FOSS
Reported Environment: MARINE; FOR COQUINITE - CONDITIONS SUITABLE FOR GROWTH OF SHELL BANKS. FOR LOWER HALF AND TOP OF UNIT (SLTST AND SH) - QUIETER CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFFERENTIATED Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:961 Base Elevation: -420 Thickness: 191
Geologic Description: QZOSE-SUBLAB CALC SST, VF-F SILTY SUBLAB MICAC SST, PBLY-CGL SST, DK GY SANDY MICAC SLTST (PY AND CALC IN PARTS); BIOTURB; MARINE AND PLT FOSS
Reported Environment: BRACKISH TO NEARSHORE AND SHALLOW MARINE TO MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY - U5-L5C-U4B-U4A (MCKELLAR 1978 P.429). ALDEBARAN ANDFREITAG REPRESENTED BY NEARSHORE MARINE FACIES

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110

Basal Information: Depth to Base:961 Base Elecation: -420 Thickness: 520
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -679 ± Thickness: >259
Geologic Description: INTBDD DK GY CARB SLTST, LT GY-BR VF-VC POORLY SRTD FLD SUBLAB SST, DK GY-BLK CARB PY SH, COAL AND SILIC SID SED-PURE SID; GLOSSOPTERIS IN SLTST
Reported Environment: PALUDAL TO LACUSTRINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INT (1 M SEAMS) 1105 -564 30
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY - LOWER STAGE 4-UPPER STAGE 4A (L4-U4A) TO STAGE 3B-LOWER STAGE 4 (3B-L4) (MCKELLAR 1978 P.429)

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:340 Base Elevation: +281 Thickness: 340
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:441 Base Elevation: +100 Thickness: 101
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS WIDESPREAD PALUDAL AND LACUSTRINE CONDITIONS DURING A MAJOR REGRESSION IN LATE PERMIAN (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:441 Base Elevation: +100 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:597 Base Elevation: -56 Thickness: 156
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:652 Base Elevation: -111 Thickness: 55
Geologic Description:
Reported Environment: SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:652 Base Elevation: -111 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:831 Base Elevation: -290 Thickness: 179
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH AND THICKNESS UNCERTAIN; TIME CORR OF FREITAG FM MAY OCCUR AS NEARSHORE MARINE FACIES FROM 770-831 M

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:924 Base Elevation: -383 Thickness: 93
Geologic Description:
Reported Environment: DEPOSITED DURING EXTENSIVE REGRESSION. LOWER BEDS MARINE IN PART
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH AND THICKNESS UNCERTAIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:924 Base Elevation: -383 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH AND THICKNESS UNCERTAIN. CONTAINS INGELARA FM AND ALDEBARAN SST.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:961 Base Elevation: -420 Thickness: 37
Geologic Description:
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOWER BOUNDARY IS A DISCONFORMITY (P.115);AREA ABOUT GSQ EDDYSTONE 1 MAYHAVE BEEN ELEVATED DURING PART OF EARLY PERMIAN

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:961 Base Elevation: -420 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:961 Base Elevation: -420 ± Thickness: 520
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CATTLE CREEK FM

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -679 S Thickness:)259
Geologic Description:
Reported Environment: DEPOSITED DURING INITIAL SUBSIDENCE OF DENISON TROUGH; UPPER REIDS DOME BEDS SEDS - DEPOSITION ON A DELTA PLAIN, UP-DIP FROM MARINE CATTLE CK FM
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGY SUGGESTS REIDS DOME BEDS IN THIS WELL DEPOSITED CONTEMP WITH LOWER CATTLE CK FM ELSEWHERE IN TROUGH (P.115)

CONTROL POINT: FLINTON 1

REFERENCE # T39 Y1
REFERENCE # T39 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/55-16	27 54'52"S	149 40'10"E	+256	+254	-2527	2781	?

REFERENCE: KELLER, A.S., HERRMANN, F.A., AND CAREY, A.R.
WELL COMPLETION REPORT NO.1B, UNION-KERN-A.O.G. FLINTON NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1322
Page Publn Year: 1963

Cross Reference:

REFERENCE: X1
THIS REPORT
Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2410 Base Elevation: -2156 Thickness: 2406
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2530 Base Elevation: -2276 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2725 Base Elevation: -2471 Thickness: 195
Geologic Description: 12% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2752 Base Elevation: -2498 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2527# Thickness:)29
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:818 Base Elevation: -564 Thickness: 814
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1545 Base Elevation: -1291 Thickness: 727
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1749 Base Elevation: -1495 Thickness: 204
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1921 Base Elevation: -1667 Thickness: 172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN-WANDOAN Age: TRIASSIC-JUR Interpretation Code:Y105
Basal Information: Depth to Base:2410 Base Elevation: -2156 Thickness: 489
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED EVERGREEN FM, PRECIPICE SST & WANDOAN FM

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:2530 Base Elevation: -2276 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2701 Base Elevation: -2447 Thickness: 171

Geologic Description: INTERBEDDED TUFFS, SHALES, COAL, SILTSTONE, MEDIUM-COARSE SANDSTONE, CONGLOMERATE AND CHERT
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL INTERVAL	2564	-2310	37 CA
	COAL INTERVAL	2621	-2367	40 CA
	COAL INTERVAL	2695	-2441	28

Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2752 Base Elevation: -2498 Thickness: 51
Geologic Description: INTBDD WH TUFF, GY-BR ARG SLTST, GY TFAC SH, GN RD-BR & WH TUFF, M-DK GY - GY-BR SH, GY ARG SL CARB SLTST, TAN-GY SH; SHELL FRAGMENTS (RARE)
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -2527± Thickness: >29
Geologic Description: INTERBEDDED TUFFS, SILTSTONES, SHALES, CHERT & CONGLOMERATE. ANDESITE AT BASE. FOSSIL FRAGMENTS
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

CONTROL POINT: GARAH 1

REFERENCE # TSO

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO EXPL. AUST.	RDH, WIRELINE	SH/55-B	29 02'16"S	149 43'39"E	+184	+189	-1412	1681	

REFERENCE: ESSO EXPLORATION AUSTRALIA
ESSO GARAH-1, N.S.W., WELL COMPLETION REPORT
ESSO EXPLORATION AUST. UNPUBLISHED REPORT. BMR FILE 66/4199 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:649 Base Elevation: -460 Thickness: 460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NO SAMPLE RETURNS ABOVE 189 M

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1081 Base Elevation: -892 Thickness: 432
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1180 Base Elevation: -991 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1253 Base Elevation: -1064 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DISCONFORMITY AT BASE

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:X105
Basal Information: Depth to Base:1560 Base Elevation: -1371 Thickness: 307
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1593 Base Elevation: -1404 Thickness: 33

Geologic Description: INTBDD DK GY CARB SH, DK GY-BR CALC ARG SLTST (WITH SCATTERED WORM TUBES) & GY ARG SILTY MICRITIC FOSSILIFEROUS LIMESTONE
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DOLERITE Age: ? Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1412% Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GIL GIL 1

REFERENCE # T51 Y1
REFERENCE # T51 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO EXPL. AUST.	RDH, CORE + WIRELINE	SH/55-8	29 11'23"S	149 52'37"E	+197	+201	-1401	1602	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
ESSO EXPLORATION AUSTRALIA
ESSO GIL GIL-1, N.S.W., WELL COMPLETION REPORT
ESSO EXPLORATION AUST. UNPUBLISHED REPORT. DMR FILE 65/4171
Page Publn Year: 1965
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:949 Base Elevation: -748 Thickness: 945
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1496 Base Elevation: -1295 Thickness: 547
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1547 Base Elevation: -1346 Thickness: 51
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1568 Base Elevation: -1367 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1568 Base Elevation: -1367 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PEAWADDY & TIKWON FMS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1568 Base Elevation: -1367 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DOLERITE Age: TERTIARY Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1401# Thickness:)34
Geologic Description: INTRUSION
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks AGE UNCERTAIN

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:559 Base Elevation: -358 Thickness: 364
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:949 Base Elevation: -748 Thickness: 390
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1496 Base Elevation: -1295 Thickness: 547
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1568 Base Elevation: -1367 Thickness: 72
Geologic Description: INTBDD LT GY QZOSE CALC VF-M POORLY SRTD SST, DK GY TFAC CALC SILTSTONE, DK GY SILTY CALC SH, DK GY-GY BR SKELETAL MICRITIC LST, BLK ANTH COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1554 -1353 7 CA
Tectonic Structure:
Remarks PERMIAN AGE FROM SPORES FROM 1513-1548 M. CALCAREOUS FOSSIL FRAGMENTS PRESENT IN SILTSTONE & SHALE

STRATIGRAPHY: DOLERITE Age: TERTIARY Interpretation Code:Y105

Basal Information: Depth to Base:TD Base Elevation: -1401' Thickness:)34
Geologic Description: INTRUSION
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks AGE UNCERTAIN

CONTROL POINT: GLENHAUGHTON 1

REFERENCE # T13 X1
REFERENCE # T13 Y1
REFERENCE # T13 Y2
REFERENCE # T13 Y3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
MARATHON PET AUS	RDH, CORE + WIRELINE	SG/55-8	25 12'30"S	149 07'45"E	+553	+557	-2314	2871	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MARATHON PETROLEUM AUSTRALIA, LTD.
A.T.P. 89P MARATHON-CONTINENTAL GLENHAUGHTON NO.1 WELL COMPLETION REPORT
MARATHON PETROLEUM AUSTRALIA, LTD. UNPUBL. REPORT (BMR FILE 63/1050)
Page Publn Year: 1964
Cross Reference:

REFERENCE: Y2
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 110-130 Publn Year: 1980
Cross Reference:

REFERENCE: Y3
MOLLAN, R.G., DICKINS, J.M., EXON, N.F.,AND KIRKEGAARD, A.G.
GEOLOGY OF THE SPRINGSURE 1:250,000 SHEET AREA, QUEENSLAND
BUREAU OF MINERAL RESOURCES REPORT NO.123
Page PL 8B Publn Year: 1969
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:84 Base Elevation: +473 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2022 Base Elevation: -1465 Thickness: 1938
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2262 Base Elevation: -1705 Thickness: 240
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X164
Basal Information: Depth to Base:2262 Base Elevation: -1705 Thickness: 240

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2621 Base Elevation: -2064 Thickness: 359
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2661 Base Elevation: -2104 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2661 Base Elevation: -2104 Thickness: 399
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2715 Base Elevation: -2158 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2728 Base Elevation: -2171 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:2728 Base Elevation: -2171 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA AND FREITAG FMS

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 577
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:X114
Basal Information: Depth to Base:TD Base Elevation: -2314* Thickness:)32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:84 Base Elevation: +473 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MIMOSA GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:2038 Base Elevation: -1481 Thickness: 1954
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF MOOLAYEMBER FM, CLEMATIS SST AND REWAN FM

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:2262 Base Elevation: -1705 Thickness: 224
Geologic Description: INTBDD SUB-BIT - BIT COAL, GY CARB SH, GY-BR ARGILLACEOUS SLTST, AND VF-C QZOSE SST; CARBONACEOUS FRAGMENTS; SLIGHTLY CALCAREOUS; PLANT REMAINS
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	2063	-1516	24
COAL INTERVAL	2153	-1596	71
COAL INTERVAL	2195	-1638	27
COAL INTERVAL	2243	-1686	20

Tectonic Structure:
Remarks: CALLED "KIANGA-UPPER BANDANNA" IN COMPLETION REPORT

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:2839 Base Elevation: -2283 Thickness: 578
Geologic Description: DK GY CARB SH, SILTY, SANDY, TUFFACEOUS AND CALCAREOUS SHALES, SLTST, LST, QZOSE AND ARG SST, AND CONGLOMERATIC SST; TRACES OF COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:2839 Base Elevation: -2283 Thickness: 578
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF "UNDIFF. PERMIAN"

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -2314* Thickness: >32
Geologic Description: ANDESITE TUFF AND ANDESITIC AGGLOMERATE-CONGLOMERATE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:2022 Base Elevation: -1465 Thickness: 2018
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:2262 Base Elevation: -1705 Thickness: 240
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS WIDESPREAD PALUDAL AND LACUSTRINE CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: EASTWARD THICKENING OF BANDANNA FM BETWEEN OSQ TARDOM 10 AND MPA GLENHAUGHTON 1 (P.130)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:2262 Base Elevation: -1705 Thickness: 240
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:2621 Base Elevation: -2064 Thickness: 359
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:2661 Base Elevation: -2104 Thickness: 40
Geologic Description:
Reported Environment: MAINLY SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:2661 Base Elevation: -2104 Thickness: 399
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:2715 Base Elevation: -2158 Thickness: 54
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:2728 Base Elevation: -2171 Thickness: 13
Geologic Description:
Reported Environment: TRANSGRESSIVE; DEPOSITION REPRESENTS RETURN TO MARINE CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:2728 Base Elevation: -2171 Thickness: 67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA AND FREITAG FMS

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 111
Geologic Description:
Reported Environment: MAINLY MARINE; REPRESENTS MAJOR MARINE TRANSGRESSION

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: RACK CREEK GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 577
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -2314# Thickness:)33
Geologic Description: VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y301
Basal Information: Depth to Base:84 Base Elevation. +473 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:)301
Basal Information: Depth to Base:2038 Base Elevation: -1481 Thickness: 1954
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:2262 Base Elevation: -1705 Thickness: 224
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y304

Basal Information: Depth to Base:2621 Base Elevation: -2864 Thickness: 359
Geologic Description:
Reported Environment: SLOW DEPOSITION IN A SILLED BASIN PROTECTED FROM STRONG CURRENTS; PERIODS OF EMERGENCE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:2711 Base Elevation: -2154 Thickness: 98
Geologic Description:
Reported Environment: DEPOSITED IN SHALLOW BASIN; MARINE IN LATER STAGES; AT TIMES SHALLOW, BRACKISH AND RESTRICTED
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:2711 Base Elevation: -2154 Thickness: 449
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 128
Geologic Description:
Reported Environment: PREDOMINANTLY MARINE, PARTLY IN A RESTRICTED BASIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y309
Basal Information: Depth to Base:2839 Base Elevation: -2282 Thickness: 577
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:TD Base Elevation: -2314? Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GLENTULLOCH 1

REFERENCE # T9 Y1
REFERENCE # T9 Y2
REFERENCE # T9 Y3
REFERENCE # T9 Y4
REFERENCE # T9 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORED, WIRELINE	SG/55-7	25 47'17"S	148 22'47"E	+459	+463	-783	1246	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.A.O. GLENTULLOCH NO.1 WELL, QUEENSLAND. WELL COMPLETION REPORT
ASSOC. AUST. OILFIELDS N.L. UNPUBL. REPORT Q/55-56P/194 BMR FILE 62/1086 Page Publn Year: 1962
Cross Reference:

REFERENCE: Y2
GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81 Page 110-130 Publn Year: 1980
Cross Reference:

REFERENCE: Y3
DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130 Page Publn Year: 1973
Cross Reference:

REFERENCE: Y4
BAUER, J.A., AND NELSON, A.W.
SOUTHERN DENISON TROUGH - INTERPRETATION OF SEISMIC DATA FROM THE WESTGROVE AREA
QUEENSLAND GOVERNMENT MINING JOURNAL, 81 Page 150-161 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:513 Base Elevation: -50 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:586 Base Elevation: -123 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:586 Base Elevation: -123 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:762 Base Elevation: -299 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INTERVAL 762-810 M COULD BE ALDEBARAN SST EQUIVALENT.

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:1221 Base Elevation: -758 Thickness: 459
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:478 Base Elevation: -15 Thickness: 474
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:514 Base Elevation: -51 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:586 Base Elevation: -123 Thickness: 72
Geologic Description: COAL, CLAYEY SST, MARLY SST, MDST; MINOR VOLCANIC ROCKS; PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 535 -72 21
Tectonic Structure:
Remarks CONSISTS OF UPPER PART OF "BANDANNA FM" OF COMPLETION REPORT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:586 Base Elevation: -123 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y105

Basal Information: Depth to Base:637 Base Elevation: -174 Thickness: 51
Geologic Description: SHALE, MINOR QZ SST, MUDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDED IN "BANDANNA FM" IN COMPLETION REPORT

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:761 Base Elevation: -298 Thickness: 124
Geologic Description: QZ SST, SHALE, MUDSTONE, LIMESTONE, PYRITIC SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF "DRY CREEK SHALE" AND "MANTUAN PRODUCTUS BED" OF COMPLETION REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:761 Base Elevation: -298 Thickness: 175
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:810 Base Elevation: -347 Thickness: 49
Geologic Description: CONGLOMERATIC SST; MACROFOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "EARLY STORMS SST" IN COMPLETION REPORT

STRATIGRAPHY: GERBIE SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:810 Base Elevation: -347 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:888 Base Elevation: -425 Thickness: 78
Geologic Description: COAL; CONGLOMERATIC SST, MUDSTONE, SHALE; PLANT FOSSILS, MACROFOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	814	-351	4
COAL	838	-375	3

Tectonic Structure:
Remarks CALLED "STAIRCASE SST" IN COMPLETION REPORT

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:888 Base Elevation: -425 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:888 Base Elevation: -425 Thickness: 302
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1220 Base Elevation: -757 Thickness: 332
Geologic Description: CONGLOMERATIC SST, QZ SST, SHALE, MUDSTONE, CONGLOMERATE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "CONGLOMERATE 'A'" AND "CONGLOMERATE 'B'" IN COMPLETION REPORT

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y114
Basal Information: Depth to Base:TD Base Elevation: -783 # Thickness: >26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:513 Base Elevation: -50 Thickness: 509
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:549 Base Elevation: -86 Thickness: 36
Geologic Description:
Reported Environment: PALUDAL AND LACUSTRINE; MAJOR REGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:549 Base Elevation: -86 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:638 Base Elevation: -175 Thickness: 89

Geologic Description:
Reported Environment: GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:677 Base Elevation: -214 Thickness: 39
Geologic Description:
Reported Environment: SHALLOW MARINE WATER (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:677 Base Elevation: -214 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:761 Base Elevation: -298 Thickness: 84
Geologic Description:
Reported Environment: MODERATLEY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:810 Base Elevation: -347 Thickness: 49
Geologic Description:
Reported Environment: DEPOSITED DURING EXTENSIVE REGRESSION; LOWER BEDS MARINE IN PART (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:810 Base Elevation: -347 Thickness: 133
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONTAINS INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:810 Base Elevation: -347 Thickness: 261
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF BLENHEIM AND GEBBIE SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -783 # Thickness: >436
Geologic Description:
Reported Environment: DEPOSITED DURING INTIAL SUBSIDENCE OF THE TROUGH (P.114)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONGLOMERATE MAY BE DUE TO THIS WELL'S PROXIMITY TO MERIVALE FAULT

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y361
Basal Information: Depth to Base:480 Base Elevation: -17 Thickness: 476
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y362
Basal Information: Depth to Base:514 Base Elevation: -51 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:555 Base Elevation: -92 Thickness: 41
Geologic Description:
Reported Environment: FLUVIAL, LACUSTRINE OR PALUDAL (P.126)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:811 Base Elevation: -348 Thickness: 256
Geologic Description:
Reported Environment: MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:811 Base Elevation: -348 Thickness: 256
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:811 Base Elevation: -348 Thickness: 256
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM OF BLENHEIM SUB-GP

STRATIGRAPHY: REIDS DOKE BEDS Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:1221 Base Elevation: -758 Thickness: 410
Geologic Description:
Reported Environment: DOMINANTLY NON-MARINE (P.32)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:TD Base Elevation: -783 ± Thickness:)25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y401
Basal Information: Depth to Base:491 Base Elevation: -28 Thickness: 407
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y402
Basal Information: Depth to Base:513 Base Elevation: -50 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y403
Basal Information: Depth to Base:584 Base Elevation: -121 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BANDANNA FM THINS BETWEEN THIS WELL AND AAO WOMBLEBANK 1

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y404
Basal Information: Depth to Base:584 Base Elevation: -121 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y405
Basal Information: Depth to Base:635 Base Elevation: -172 Thickness: 51

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y406
Basal Information: Depth to Base:697 Base Elevation: -234 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PEAWADDY FM THINS BETWEEN THIS WELL AND AAO WOMBLEBANK 1 (P.157)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y407
Basal Information: Depth to Base:697 Base Elevation: -234 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y408
Basal Information: Depth to Base:757 Base Elevation: -294 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INGELARA FM THINS CONSIDERABLY BETWEEN AAO GLENTULLOCH 1 AND AAO WOMBLEBANK 1

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:Y409
Basal Information: Depth to Base:876 Base Elevation: -413 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks COAL SEAMS WITHIN THIS SEQUENCE (P.157).

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y410
Basal Information: Depth to Base:876 Base Elevation: -413 Thickness: 179
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM AND UNDIFFERENTIATED EARLY PERMIAN

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y411
Basal Information: Depth to Base:876 Base Elevation: -413 Thickness: 292
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND GEBBIE SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y412
Basal Information: Depth to Base:1221 Base Elevation: -758 Thickness: 345
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y413
Basal Information: Depth to Base:TD Base Elevation: -783 ± Thickness:)26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GOONDIWINDI 1

REFERENCE # T47 Y1
REFERENCE # T47 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/56-1	28 38'25"S	150 11'28"E	+212	+216	-2007	2223	?

REFERENCE: X1
THIS REPORT
Page
Publn Year:
Cross Reference:

REFERENCE: Y1
HERRMANN, F.A.
WELL COMPLETION REPORT NO.30, UNION-KERN-A.O.G. GOONDIWINDI NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 64/4057
Page
Publn Year: 1964
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1423 Base Elevation: -1207 Thickness: 1419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CABAWIN FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1584 Base Elevation: -1368 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2210 Base Elevation: -1994 Thickness: 626
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -2007# Thickness:)13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:453 Base Elevation: -237 Thickness: 449
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:978 Base Elevation: -762 Thickness: 525
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1166 Base Elevation: -950 Thickness: 188
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1423 Base Elevation: -1207 Thickness: 257
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HUTTON SST TO PRECIPICE SST

STRATIGRAPHY: CABAWIN FM Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1584 Base Elevation: -1368 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER-BACK CK Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:2210 Base Elevation: -1994 Thickness: 626
Geologic Description: TUFFACEOUS SST & CONGLOMERATE WITH A FEW INTERBEDS OF GY ASHY OR DK GY CARBONACEOUS SHALE. THIN COAL BEDS. MARINE FOSSILS & FOSSIL FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
MARINE FOSSILS 1844 -1628 46
COAL INTERVAL 2194 -1978 315
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BLACKWATER GP + BACK CREEK GP. PERMIAN AGE FOR SPORES AT 1698 & 1960 M (BACK CK GP CORR.)

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -2007 Thickness:)13
Geologic Description: UNDIFFERENTIATED VOLCANIC ASH & ANDESITE FLOWS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KENTUCKY 1

REFERENCE # T41 Y1
REFERENCE # T41 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/55-4	28 01'31"S	149 18'58"E	+237	+241	-1905	2146	7

REFERENCE: X1
THIS REPORT

REFERENCE: Y1 PYLE, D.E.
WELL COMPLETION REPORT, UNION-KERN-A.O.G. KENTUCKY NO.1
UNION OIL DEVELOPMENT CORPORATION UNPUBLISHED REPORT Page Publn Year: 1966
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1894 Base Elevation: -1653 Thickness: 1890
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2053 Base Elevation: -1812 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2105 Base Elevation: -1864 Thickness: 52
Geologic Description: 21% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2116 Base Elevation: -1875 Thickness: 11
Geologic Description: GAMMA LOG SHOWS COARSENING-UPWARDS SEQUENCE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2116 Base Elevation: -1875 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MUGGLETON FM

STRATIGRAPHY: BACK CREEK.GP Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:2116 Base Elevation: -1875 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MUGGLETON FM OF BLENHEIM SUB-GP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1905* Thickness: >30
Geologic Description: VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:911 Base Elevation: -670 Thickness: 907
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1523 Base Elevation: -1282 Thickness: 612
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1684 Base Elevation: -1443 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1812 Base Elevation: -1571 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1894 Base Elevation: -1653 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:2053 Base Elevation: -1812 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2116 Base Elevation: -1875 Thickness: 63
Geologic Description: BLK COAL, C-CBL CGL SST, CR TUFF, DK GY-BR CARB SH, LT-DK GY TFAC CARB SH, LT GY-BR CARB SLTST, M-DK GY CARB SLTST, LT GY C QZ-LI TFAC SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 2062 -1821 2 CA
COAL INTERVAL 2080 -1839 7 CA
Tectonic Structure:
Remarks PLANT REMAINS IN SHALE

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1905± Thickness: >30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KIA ORA 1

REFERENCE # T6 Y1
REFERENCE # T6 Y2
REFERENCE # T6 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH	SG/55-8	25 39'00"S	148 37'00"E	+482	+486	-1170	1656	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

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GRAY, A.R.G.
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BAUER, J.A., AND NELSON, A.W.
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QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 150-161 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:778 Base Elevation: -292 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:898 Base Elevation: -412 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:898 Base Elevation: -412 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1304 Base Elevation: -818 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X135
Basal Information: Depth to Base:1304 Base Elevation: -819 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:TD Base Elevation: -1170# Thickness: 1352
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:778 Base Elevation: -292 Thickness: 774
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:899 Base Elevation: -413 Thickness: 121
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS WIDESPREAD PALUDAL AND LACUSTRINE CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:899 Base Elevation: -413 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:988 Base Elevation: -502 Thickness: 89
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1048 Base Elevation: -562 Thickness: 60
Geologic Description:
Reported Environment: MAINLY SHALLOW MARINE
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1048 Base Elevation: -562 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1195 Base Elevation: -709 Thickness: 147
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: FREITAG FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1237 Base Elevation: -751 Thickness: 42
Geologic Description:
Reported Environment: TRANSGRESSIVE; DEPOSITION REPRESENTS RETURN TO MARINE CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1237 Base Elevation: -751 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF INGELARA FM AND FREITAG FM

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1305 Base Elevation: -819 Thickness: 68
Geologic Description:
Reported Environment: MAINLY MARINE; REPRESENTS MAJOR MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1305 Base Elevation: -819 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1305 Base Elevation: -819 Thickness: 406

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -11768 Thickness: 3351
Geologic Description:
Reported Environment: DEPOSITED DURING INITIAL SUBSIDENCE OF DENISON TROUGH
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y201
Basal Information: Depth to Base:357 Base Elevation: +129 Thickness: 353
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:787 Base Elevation: -301 Thickness: 430
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:898 Base Elevation: -412 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:898 Base Elevation: -412 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:967 Base Elevation: -481 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y286
Basal Information: Depth to Base:1837 Base Elevation: -551 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y287
Basal Information: Depth to Base:1837 Base Elevation: -551 Thickness: 139
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y288
Basal Information: Depth to Base:1195 Base Elevation: -709 Thickness: 158
Geologic Description:
Reported Environment: SLIGHT UPWARPING OCCURRED ON WESTGROVE ANTICLINE DURING DEPOSITION OF THIS UNIT AND/OR UNDIFF. EARLY PERMIAN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:Y289
Basal Information: Depth to Base:1304 Base Elevation: -818 Thickness: 109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1304 Base Elevation: -818 Thickness: 406
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM SUB-GP (AS ABOVE), INGELARA FM AND UNDIFF EARLY PERMIAN

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -1170± Thickness:)352
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KILDARE NORTH 1

REFERENCE # T5 Y1
REFERENCE # T5 Y2
REFERENCE # T5 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH	SG/55-7	25 40'43"S	148 22'33"E	+469	+473	-917	1390	

REFERENCE: X1
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Page Publn Year:
Cross Reference:

REFERENCE: Y1
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Page 110-130 Publn Year: 1980
Cross Reference: SMITH K.G. ET AL. 1969, BMR RECORD 1969/153, 11

REFERENCE: Y2
BAUER, J.A., AND NELSON, A.W.
SOUTHERN DENISON TROUGH - INTERPRETATION OF SEISMIC DATA FROM THE WESTGROVE AREA
QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 150-161 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:727 Base Elevation: -284 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BANDANNA F[illegible] Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to B[illegible] 835 Base Elevation: -362 Thickness: 108
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:835 Base Elevation: -362 Thickness: 198
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X130
Basal Information: Depth to Base:1061 Base Elevation: -588 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X146
Basal Information: Depth to Base:1148 Base Elevation: -667 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:1163 Base Elevation: -690 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON GP Age: PERMIAN Interpretation Code:X155
Basal Information: Depth to Base:1163 Base Elevation: -690 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y160
Basal Information: Depth to Base:TD Base Elevation: -917 * Thickness: >227
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:727 Base Elevation: -254 Thickness: 723
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:765 Base Elevation: -292 Thickness: 38
Geologic Description:
Reported Environment: PALUDAL AND LACUSTRINE CONDITIONS DURING MAJOR REGRESSION (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:765 Base Elevation: -292 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:878 Base Elevation: -405 Thickness: 113
Geologic Description:
Reported Environment: GRADIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:951 Base Elevation: -478 Thickness: 73
Geologic Description:
Reported Environment: SHALLOW MARINE WATER (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:951 Base Elevation: -478 Thickness: 186
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1061 Base Elevation: -586 Thickness: 110
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1140 Base Elevation: -667 Thickness: 79
Geologic Description:
Reported Environment: DEPOSITED DURING REGRESSION; LOWER MARINE IN PART(P,115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1140 Base Elevation: -667 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1163 Base Elevation: -690 Thickness: 23

Geologic Description:
Reported Environment: MAJOR MARINE TRANSGRESSION (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1163 Base Elevation: -690 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF CATTLE CREEK FM.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1163 Base Elevation: -690 Thickness: 398
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, CEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -917 * Thickness: 1227
Geologic Description:
Reported Environment: DEPOSITED DURING INITIAL SUBSIDENCE OF THE DENISON TROUGH (P.114)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOTAL DEPTH FROM SMITH ET AL. 1969

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y201
Basal Information: Depth to Base:471 Base Elevation: +2 Thickness: 467
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:726 Base Elevation: -253 Thickness: 255
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:835 Base Elevation: -362 Thickness: 109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:835 Base Elevation: -362 Thickness: 169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:877 Base Elevation: -404 Thickness: 42
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:953 Base Elevation: -480 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:953 Base Elevation: -917 # Thickness: 118
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1062 Base Elevation: -589 Thickness: 109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1224 Base Elevation: -751 Thickness: 162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1224 Base Elevation: -751 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM AND UNDIFFERENTIATED EARLY PERMIAN

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:1271 Base Elevation: -798 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:1271 Base Elevation: -798 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:1271 Base Elevation: -798 Thickness: 436
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GERBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y214
Basal Information: Depth to Base:TD Base Elevation: -917 $ Thickness: >119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY WITHIN REIDS DOME BEDS NEAR THIS WELL, ADJACENT TO MERIVALE FAULT (P.155)

CONTROL POINT: KILLORAN 1

REFERENCE # T12 Y1
REFERENCE # T12 Y2
REFERENCE # T12 Y3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORED, WIRELINE	SG/55-7	25 54'00"S	148 19'00"E	+517	+528	-196	716	?

REFERENCE: Y1 MINES ADMINISTRATION PTY. LTD.
AAO KILLORAN NO.1 WELL, QUEENSLAND. WELL COMPLETION REPORT
ASSOC. AUST. OILFIELDS N.L. UNPUBL REPORT Q/55-56?/108 BMR FILE 62/1098 Page Publn Year:
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BUREAU OF MINERAL RESOURCES BULLETIN 130 Page Publn Year: 1973
Cross Reference:

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QUEENSLAND GOVERNMENT MINING JOURNAL, 81 Page 110-130 Publn Year: 1980
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:579 Base Elevation: -59 Thickness: 576
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:619 Base Elevation: -99 Thickness: 40
Geologic Description: WH-DK GY M CALC PY QZOSE SST, GY CARB ARG SL CALC QZOSE OR FLD SLTST, DK GY CARB ARG SL PY AND MICAC SH; SHELL FRAGMENTS AND BRACHIOPOD SPINES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "DRY CREEK-SHALE" IN COMPLETION REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:619 Base Elevation: -99 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 84
Geologic Description: WH-GY QZOSE PBL CGL, GY F-M ARG CARB QZOSE SST, GY-GN F FLD LI QZOSE SST, GY CARB FLD MICAC CARB PY SH; SHELL FRAGS AND BRACHIOPOD SPINES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "EARLY STORMS SST" IN COMPLETION REPORT

STRATIGRAPHY: GEBRIE SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATHERINE SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM OF BLENHEIM SUB-GP AND CATHERINE SST OF GEBBIE SUB-GP

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -196 * Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:579 Base Elevation: -59 Thickness: 576
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 124
Geologic Description:
Reported Environment: MARINE (P.55)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNDIFFERENTIATED

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF UNDIFFERENTIATED BLENHEIM SUB-GP

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:TD Base Elevation: -196 * Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y301
Basal Information: Depth to Base:579 Base Elevation: -59 Thickness: 576
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:591 Base Elevation: -71 Thickness: 12
Geologic Description:
Reported Environment: SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:591 Base Elevation: -71 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 112
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM

STRATIGRAPHY: RACK CREEK GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:703 Base Elevation: -183 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM OF BLENHEIM SUB-GP AND INGELARA FM OF GEBBIE SUB-GP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:TD Base Elevation: -196 * Thickness: 313

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LAWSON 1

REFERENCE # T29

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 06'56"S	150 24'59"E	+332	+336	-1314	1650	

REFERENCE: UNION OIL DEVELOPMENT CORPORATION
PRELIMINARY FINAL REPORT, UNION-KERN-A.O.G. LAWSON NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 64/4054 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:679 Base Elevation: -343 Thickness: 675
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:X102
Basal Information: Depth to Base:1098 Base Elevation: -762 Thickness: 419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1312 Base Elevation: -976 Thickness: 214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1473 Base Elevation: -1137 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1563 Base Elevation: -1227 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1348 Thickness: 187

Geologic Description: INTERBEDDED SILTSTONES, SHALES, SANDSTONES, COAL AND TUFF
Reported Environment:
Interpreted Environment: GAMMA-RAY LOG SHOWS FINING-UPWARDS CYCLES
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1593	-1257	8 CA
COAL INTERVAL	1601	-1265	4 CA
COAL	1640	-1304	2 CA
COAL	1644	-1308	2 CA

Tectonic Structure:
Remarks

CONTROL POINT: LIMEBON 1

REFERENCE # T48 Y1
REFERENCE # T48 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/56-1	28 49'06"S	150 03'47"E	+208	+213	-1797	2010	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
BRADLEY, K.
WELL COMPLETION REPORT NO.35, UNION-KERN-A.O.G. LIMEBON NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 67/4265
Page Publn Year: 1968
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1413 Base Elevation: -1200 Thickness: 1408
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thic'ness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1700 Base Elevation: -1487 Thickness: 287
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -1797* Thickness:)310
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:629 Base Elevation: -416 Thickness: 624
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1108 Base Elevation: -895 Thickness: 479
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1238 Base Elevation: -1025 Thickness: 130
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-EVERGREEN Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1413 Base Elevation: -1200 Thickness: 175
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HUTTON SST & EVERGREEN FM

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1700 Base Elevation: -1487 Thickness: 287
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER-BACK CK Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1797# Thickness:)310
Geologic Description: DK GY INDURATED SH, TIGHT TFAC SST, LT GY M-C SL TFAC POROUS SST, & LT GY F-M TFAC TIGHT SST WITH INTBDD TFAC SLTST & THIN BEDS VOLC LI CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1990 -1777 3 CA
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BLACKWATER GROUP & BACK CREEK GP

CONTROL POINT: LYNROCK 1

REFERENCE # T27

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/55-16	27 26'08"S	149 09'55"E	+287	+291	-1803	2094	

REFERENCE: HERRMANN, F.A., CAREY, A.R., AND KELLER, A.
WELL COMPLETION REPORT NO.22, UNION-KERN-A.O.G. LYNROCK NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1051 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:707 Base Elevation: -416 Thickness: 703
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1376 Base Elevation: -1085 Thickness: 669
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM T

STRATIGRAPHY: WALLOON Gh Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1586 Base Elevation: -1295 Thickness: 210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1750 Base Elevation: -1459 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1881 Base Elevation: -1590 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:X106
Basal Information: Depth to Base:2021 Base Elevation: -1730 Thickness: 140

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2076 Base Elevation: -1785 Thickness: 55
Geologic Description: COAL, TUFF, SILTSTONE AND TIGHT SANDSTONE
Reported Environment:
Interpreted Environment:GAMMA LOG SHOWS FINING-UPWARDS CYCLE
Geologic Features: Feature Depth Elevation Thickness
COAL SEAMS T'OUT
Tectonic Structure:
Remarks UNCONFORMITIES AT TOP & BASE. 28% COAL (P. O'BRIEN - THIS REPORT)

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X188
Basal Information: Depth to Base:TD Base Elevation: -1803 Thickness: >18
Geologic Description: METAMORPHICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MACINTYRE 1

REFERENCE # T46

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/55-4	28 37'10"S	149 51'00"E	+194	+198	-2338	2536	

REFERENCE: HERRMANN, F.A.
WELL COMPLETION REPORT NO.29, UNION-KERN-A.O.G. MACINTYRE NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 64/4006 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:856 Base Elevation: -658 Thickness: 852
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1423 Base Elevation: -1225 Thickness: 567
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1582 Base Elevation: -1384 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1923 Base Elevation: -1725 Thickness: 341
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HUTTON SST, EVERGREEN FM & PRECIPICE SST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X105
Basal Information: Depth to Base:2121 Base Elevation: -1923 Thickness: 198
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2207 Base Elevation: -2009 Thickness: 86

Geologic Description: SOFT WH VOLC ASH, INTBDD COAL AND DK GY-BLK HIGHLY CARB SH, DK GY SH WITH TUFFACEOUS SLTST AND CARBONACEOUS STRINGERS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	2152	-1954	18 CA

Tectonic Structure:
Remarks: CONTAINS 10% COAL (O'BRIEN - THIS REPORT)

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2466 Base Elevation: -2268 Thickness: 259
Geologic Description: GY CARB SH, GY FOSSILIFEROUS SLTST, SCATTERED VOLC ROCK FRAGMENTS, STRINGERS TFAC SST, THIN BEDS WH-CR SOFT VOLC ASH, DK GY CALC SH, VOLC FLOWS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
VOLCANICS	2349	-2151	24 CA
COAL	2352	-2154	1.5 CA
VOLCANICS	2373	-2175	5 CA
VOLCANICS	2405	-2207	12 CA

Tectonic Structure:
Remarks: VOLCS: 5 M AT 2385 M, 3 M AT 2456 M, 2 M AT 2465.

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -2338@ Thickness:)70
Geologic Description: VOLCANIC FLOWS & TUFF
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

CONTROL POINT: MEELEEBEE 1

REFERENCE # T18 Y1
REFERENCE # T18 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORE + WIRELINE	SG/55-12	26 11'00"S	149 12'00"E	+314	+317	-1230	1547	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
ASSOCIATED AUSTRALIAN OILFIELDS N.L. AAO MEELEEBEE NO.1 WELL, QUEENSLAND
UNPUBLISHED COMPANY REPORT NO. Q/55-56P/106. BMR FILE 62/1213
Page Publn Year: 1962
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:841 Base Elevation: -524 Thickness: 838
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1081 Base Elevation: -764 Thickness: 240
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1311 Base Elevation: -994 Thickness: 230
Geologic Description: 10% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1311 Base Elevation: -994 Thickness: 230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1360 Base Elevation: -1043 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1460 Base Elevation: -1143 Thickness: 100
Geologic Description: 2% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1460 Base Elevation: -1143 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH & TINOWON FM

STRATIGRAPHY: UNDIFF BACK CREEK GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1534 Base Elevation: -1217 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:1534 Base Elevation: -1217 Thickness: 223
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GP & UNDIFF BACK CREEK GP

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -1230 Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:390 Base Elevation: -73 Thickness: 387
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:655 Base Elevation: -338 Thickness: 265

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y123
Basal Information: Depth to Base:778 Base Elevation: -461 Thickness: 123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y184
Basal Information: Depth to Base:841 Base Elevation: -524 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y185
Basal Information: Depth to Base:1082 Base Elevation: -765 Thickness: 241
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-BLACK ALLEY Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1294 Base Elevation: -977 Thickness: 212
Geologic Description: F-M + VF-F QZOSE, & M-C LI QZOSE SSIS, CALC QZOSE SLTST, ARG CARB FLD QZOSE SLTST, FLD? PY SLTST, SL CARB QZOSE SLTST, GY-BLK SL CARB SH, COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAMS T'OUT
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks: * BLACKWATER GP (BANDANNA FM) NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: * BLACK ALLEY SH NOT DIFFERENTIATED IN THIS INTERPRETATION. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1498 Base Elevation: -1181 Thickness: 204
Geologic Description: DK GY CARB MICAC SH, WH-CR CARB SH, LT-DK GY FLD CARB SLTST, GY-WH QZOSE SLTST, F & F-M LI-QZOSE SSTS, F ARG QZOSE SST, CALC SST; BRACH SPINES
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
MANTUAN PRODUCTUS BD 1350 -1133 55
Tectonic Structure:
Remarks: CALLED MANTUAN DOWNS PRODUCTUS BED + DRY CREEK SHALE IN W.C.R. ALSO CONTAINS SHELL FRAGMENTS

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1498 Base Elevation: -1181 Thickness:)204*
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: * THICKNESS UNCERTAIN AS SUB-GP CONTAINS PEAWADDY FM + UNDIFF BLACK ALLEY SH

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1534 Base Elevation: -1217 Thickness: 36
Geologic Description: QZ & SH PBL CGL WITH GY F-M MICAC CARB SST MATRIX, WH F-M SL CALC LI QZOSE SST, WH-GY CARB PY LI QZOSE SLTST, DK GY PY SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CALLED EARLY STORMS SST IN W.C.R.

STRATIGRAPHY: DEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1534 Base Elevation: -1217 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS CATHERINE SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:1534 Base Elevation: -1217 Thickness:)240*
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: * THICKNESS UNCERTAIN. CONTAINS CATHERINE SST (DEBBIE SUB-GP) + PEAWADDY FM & (UNDIFF) BLACK ALLEY SH (BLENHEIM SUB-GP)

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y115
Basal Information: Depth to Base:TD Base Elevation: -1230* Thickness:)13
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MINIMA 1

REFERENCE # T43 Y1
REFERENCE # T43 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/56-1	28 21'33"S	150 07'00"E	+207	+211	-1966	2177	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MACK, J.E.
WELL COMPLETION REPORT NO.8, UNION-KERN-A.O.G. MINIMA NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 62/1306
Page Publn Year: 1962
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base: 4736 Base Elevation: -1525 Thickness: 1732
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1875 Base Elevation: -1664 Thickness: 139
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1920 Base Elevation: -1709 Thickness: 45
Geologic Description: 37% COAL. SP CURVE SHOWS COARSENING-UP SEQUENCE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2068 Base Elevation: -1857 Thickness: 148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -1966± Thickness: 109
Geologic Description: VOLCANICS
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:882 Base Elevation: -671 Thickness: 878
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1212 Base Elevation: -1001 Thickness: 330
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1395 Base Elevation: -1184 Thickness: 183
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1736 Base Elevation: -1525 Thickness: 341
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BUNDAMBA FM IN W.C.R. REPRESENTS UNDIFFERENTIATED HUTTON SST - PRECIPICE SST

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1875 Base Elevation: -1664 Thickness: 139
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CABAWIN FM IN W.C.R.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1909 Base Elevation: -1698 Thickness: 34
Geologic Description: BLK SHALY COAL, GN-WH SST WITH M-GRANULE QZ & TUFF GRAINS IN TFAC MATRIX, BR-GY CARBONACEOUS SHALE & THIN WH TUFF BEDS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1882	-1671	3 CA
COAL	1907	-1696	4 CA

Tectonic Structure:
Remarks SPORES DATE THIS UNIT AS UPPER PERMIAN

STRATIGRAPHY: BACK (?)EK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth, Base:2067 Base Elevation: -1856 Thickness: 159
Geologic Description: GY-BL , , BR FINELY CARB SL CALC & TFAC SH & SLTST, WH TUFF, LT GY-WH F-PBLY TFAC SST. SCATTERED SHELL FRAGS, CRINOID STEMS, PRODUCTID SPINES
Reported Environment: SHALLOW ..TER MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1966? Thickness: 110
Geologic Description: WEATHERED BRECCIATED AND FRACTURED BLUE GREY TO GREEN TUFF AND PURPLE TO GREEN ANDESITE FLOWS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MONCLOVA 1

REFERENCE # T24

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HARTOGEN EXPL.	RDH, WIRELINE	SG/55-16	27 00'35"S	148 57'12"E	+278	+281	-1464	1745	

REFERENCE: BENBOW, D.D.
WELL COMPLETION REPORT MONCLOVA NO.1, AUTHORITY TO PROSPECT 145P, QUEENSLAND
HARTOGEN EXPLORATION PTY LTD UNPUBLISHED REPORT. BMR FILE 74/216 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:337 Base Elevation: -56 Thickness: 334
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:X102
Basal Information: Depth to Base:458 Base Elevation: -177 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOGA SST Age: CRETACEOUS Interpretation Code:X103
Basal Information: Depth to Base:594 Base Elevation: -313 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ORALLO FM Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:770 Base Elevation: -489 Thickness: 176
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CUBBERAMUNDA SST Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:868 Base Elevation: -587 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SPRINGBOK SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:1025 Base Elevation: -744 Thickness: 157

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:X107
Basal Information: Depth to Base:1241 Base Elevation: -960 Thickness: 216
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X108
Basal Information: Depth to Base:1436 Base Elevation: -1155 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X109
Basal Information: Depth to Base:1579 Base Elevation: -1298 Thickness: 143
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NOOLAYEMBER FM Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:1662 Base Elevation: -1381 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:1732 Base Elevation: -1451 Thickness: 70
Geologic Description: COAL & CARB SH WITH INTBDS SLTST & MINOR DIRTY SST. INTBDS TUFF, CHERT BELOW 1679 M. BELOW 1710 M - "WASH" UNIT (WITH FRAGMENTS OF B'MENT ROCK)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1668	-1387	5
COAL INTERVAL	1706	-1425	19

Tectonic Structure:
Remarks LOWER 21 M IS WEATHERED, BRECCIATED ZONE (O'BRIEN - THIS REPORT)

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X112
Basal Information: Depth to Base:TD Base Elevation: -1464* Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

CONTROL POINT: MOONIE 1

REFERENCE # T34 Y1
REFERENCE # T34 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 44'54"S	150 15'25"E	+268	+272	-1589	1861	?

REFERENCE: UNION OIL DEVELOPMENT CORPORATION
WELL COMPLETION REPORT NO.3, UNION-KERN-A.O.G. MOONIE NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 62/1084 Page Publn Year: 1962

Cross Reference:

REFERENCE: X1
THIS REPORT Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:61 Base Elevation: +211 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1798 Base Elevation: -1526 Thickness: 1737
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -1589* Thickness: >63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
DACITE TD -1589* >17
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:61 Base Elevation: +211 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:731 Base Elevation: -459 Thickness: 670
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN W.C.R.

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:1078 Base Elevation: -806 Thickness: 347
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1389 Base Elevation: -1117 Thickness: 311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1808 Base Elevation: -1536 Thickness: 419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BUNDAKRA FM IN W.C.R. REPRESENTS UNDIFFERENTIATED HUTTON SST-PRECIPICE SST

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1D Base Elevation: -1589% Thickness:)53
Geologic Description: M-DK GY SLTST-TFAC SST (CONTAINING QZ FLD MICA), GY SL CALC SH, M RED-WH SST, PEBBLES OF CONGLOMERATE AND DACITE (PPDEARLY TUFFACEOUS IN PART)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MT. PLEASANT 1

REFERENCE # TS2 Y1
REFERENCE # TS2 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO EXPL. AUST.	RDH, CORE + WIRELINE	SH/56-5	29 10'06"S	150 03'49"E	+219	+224	-2042	2266	?

REFERENCE: X1
THIS REPORT
Page Publn Year:

Cross Reference:

REFERENCE: Y1
ESSO EXPLORATION AUSTRALIA
ESSO MT. PLEASANT-1, N.S.W., WELL COMPLETION REPORT
ESSO EXPLORATION AUST. UNPUBLISHED REPORT. BMR FILE 65/4184
Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:959 Base Elevation: -735 Thickness: 954
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1391 Base Elevation: -1167 Thickness: 432
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2013 Base Elevation: -1769 Thickness: 622
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGABRI VOLCANICS Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2265 Base Elevation: -2041 Thickness: 252
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: IGNEOUS ROCK Age: PRE-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2042 Thickness: >1
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:462 Base Elevation: -238 Thickness: 457
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:846 Base Elevation: -622 Thickness: 384
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:939 Base Elevation: -715 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:959 Base Elevation: -735 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1387 Base Elevation: -1163 Thickness: 428
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GOONDIWINDI CGL Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:2265 Base Elevation: -2041 Thickness: 878
Geologic Description: INTBDD LT GN-GY ANG-RND SED & VOLC PBL-CBL CGL, LT-M GY & BR GY SANDY TFAC CALC CARB SLTST, DK GY CARB SH, DULL BR-BLK SHALY - BLK VIT COAL, IF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
THIN COAL SEAMS T'OUT
Tectonic Structure:
Remarks ALSO CONTAINS BASALTIC IGNEOUS ROCK. UNIT CALLED GOONDIWINDI CONGLOMERATE IN W.C.R.

STRATIGRAPHY: IGNEOUS ROCK Age: CARBONIFEROUS Interpretation Code:Y107

Basal Information: Depth to Base:TD Base Elevation: -2042 Thickness: >1
Geologic Description: GRANITE OR DIORITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MYALL CREEK 1

REFERENCE # T2S Y1
REFERENCE # T2S X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, WIRELINE	SG/55-16	27 84'47"S	149 12'11"E	+245	+249	-1933	2182	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
HERRMANN, F.A.
WELL COMPLETION REPORT NO.24, UNION-KERN-A.O.G. MYALL CREEK NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1062
Page Publn Year: 1964
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X191
Basal Information: Depth to Base:1859 Base Elevation: -1610 Thickness: 138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1945 Base Elevation: -1696 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2036 Base Elevation: -1787 Thickness: 91
Geologic Description: 34.5% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X184
Basal Information: Depth to Base:2036 Base Elevation: -1787 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2065 Base Elevation: -1816 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2160 Base Elevation: -1911 Thickness: 95
Geologic Description: 20.7% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X188
Basal Information: Depth to Base:2160 Base Elevation: -1911 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH & TINOWON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X189
Basal Information: Depth to Base:2160 Base Elevation: -1911 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP (AS ABOVE)

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -1933± Thickness: >22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:472 Base Elevation: -223 Thickness: 468
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-CUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1063 Base Elevation: -814 Thickness: 591
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO CUBBERAMUNDA SST

STRATIGRAPHY: WALLOON FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1321 Base Elevation: -1072 Thickness: 258

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1545 Base Elevation: -1296 Thickness: 224
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1721 Base Elevation: -1472 Thickness: 176
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE-WANDOAN Age: TRIASSIC-JUR Interpretation Code:Y106
Basal Information: Depth to Base:1859 Base Elevation: -1610 Thickness: 138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFF PRECIPICE SST + WANDOAN FM

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1945 Base Elevation: -1696 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2159 Base Elevation: -1910 Thickness: 214
Geologic Description: TUFFACEOUS SANDSTONE, VOLCANIC ASH AND MEDIUM TO THICK COAL BEDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 2035 -1786 90
COAL INTERVAL 2131 -1882 45
Tectonic Structure:
Remarks CALLED KIANGA FM IN W.C.R.

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1933# Thickness: >23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

CONTROL POINT: PAGET 1

REFERENCE # T32

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.D.G	RDH, CORE + WIRELINE	SG/56-13	27 27'46"S	150 31'31"E	+316	+319	-1318	1637	

REFERENCE: UNION OIL DEVELOPMENT CORPORATION
PRELIMINARY FINAL REPORT, UNION-KERN-A.D.G. PAGET NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1327 Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:762 Base Elevation: -443 Thickness: 759
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN REFERENCE. REPRESENTS UNDIFFERENTIATED BUNGIL FM-GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:X102
Basal Information: Depth to Base:1127 Base Elevation: -808 Thickness: 365
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN REFERENCE

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1342 Base Elevation: -1023 Thickness: 215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1509 Base Elevation: -1190 Thickness: 167
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1610 Base Elevation: -1291 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1318# Thickness: >27

Geologic Description: DK GY SANDY SLTST, GY PARTLY CARB & CALC SLTST, TAN-CREAM F-C SST, LT GY F-C TFAC CALC SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM "DESCRIPTION OF CUTTINGS"

CONTROL POINT: SILVER VALLEY 1

REFERENCE # T21 Y1
REFERENCE # T21 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST RES	RDH, WIRELINE	SG/55-12	26 43'36"S	149 15'51"E	+329	+334	-2005	2339	?

REFERENCE: GROVES, R.D., AND BROWN, L.N. (MINES ADMINISTRATION)
WELL COMPLETION REPORT A.A.R. APPLE TREE NO.1, A.A.R. SILVER VALLEY NO.1
UNPUBLISHED COMPANY REPORT NO.Q/119P/560. BMR FILE 73/261 Page Publn Year: 1974

Cross Reference:

REFERENCE: X1
THIS REPORT Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1517 Base Elevation: -1183 Thickness: 1512
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1989 Base Elevation: -1655 Thickness: 472
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2103 Base Elevation: -1769 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2103 Base Elevation: -1769 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2140 Base Elevation: -1806 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feat Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2237 Base Elevation: -1903 Thickness: 97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:X10B
Basal Information: Depth to Base:2280 Base Elevation: -1946 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2280 Base Elevation: -1946 Thickness: 177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ROCK SHALE, TINOWON FM & MUGGLETON FM

STRATIGRAPHY: UNDIFF BACK CREEK GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:2325 Base Elevation: -1991 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:2325 Base Elevation: -1991 Thickness: 222
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP AND UNDIFFERENTIATED BACK CREEK GROUP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:TD Base Elevation: -2005± Thickness: >14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:174 Base Elevation: +160 Thickness: 169

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:279 Base Elevation: +55 Thickness: 105
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOGRA SST Age: CRETACEOUS Interpretation Code:Y103
Basal Information: Depth to Base:411 Base Elevation: -107 Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CRALLO FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:576 Base Elevation: -242 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUBBERAMUNDA SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:650 Base Elevation: -316 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y1
Basal Information: Depth to Base:1137 Base Elevation: -803 Thickness: 48.
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure.
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1373 Base Elevation: -1039 Thickness: 236
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Rem...s

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1514 Base Elevation: -1180 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1517 Base Elevation: -1183 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:1724 Base Elevation: -1390 Thickness: 207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOWGROUNDS SST Age: TRIASSIC Interpretation Code:Y111
Basal Information: Depth to Base:1728 Base Elevation: -1394 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y112
Basal Information: Depth to Base:1989 Base Elevation: -1655 Thickness: 261
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:2081 Base Elevation: -1747 Thickness: 92
Geologic Description: DK BR V CARB SH - DULL BLK COAL, WH TFAC SH (LOWER PART), GY-BR QZOSE SL FLD LI CARB SLTST, GY M-C QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2014	-1680	6 CA
COAL	2028	-1694	1 CA
COAL	2049	-1715	6 CA
COAL	2066	-1732	1 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y114

Basal Information: Depth to Base:2081 Base Elevation: -1747 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:2117 Base Elevation: -1783 Thickness: 36
Geologic Description: LT GY HARD FINELY CARB SLTST + SH ABOVE COAL, SOFTER SH + SLTST (CARB LAM) BELOW COAL, WH ?TFAC BANDS, DK BR CARB SH - DULL BLK COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
WINNATHOOLA COAL MB	2103	-1769	8

Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:2214 Base Elevation: -1880 Thickness: 97
Geologic Description: GY SL FLD PY QZOSE SLTST, GY MON-FOS QZOSE SL PY SLTST, F-C QZOSE LI FLD SST, GY-BR CARB SH + SLTST - DULL BLK SHALY COAL, GY VF-F QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	2135	-1801	18
WALLABELLA COAL MB	2193	-1859	23
COAL	2142	-1808	1.5 CA

Tectonic Structure:
Remarks 2 SEAMS IN WALLABELLA COAL MEMBER. SHELL FRAGMENTS AND SPINES PRESENT THROUGHOUT MANUTUAN PRODUCTUS BED

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:Y118
Basal Information: Depth to Base:2325 Base Elevation: -1991 Thickness: 111
Geologic Description: DK GY HARD QZOSE SL FLD CARB MICAC PY SLTST, DK GY SILTY PY + CARB SH, GY M-C MOD WELL SRTD SL MICAC PY SST, BR LST + GY BR SLTST, F-C QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LORELLE SST MB	2279	-1945	25

Tectonic Structure:
Remarks GRADATIONAL BOUNDARY AT TOP

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y119
Basal Information: Depth to Base:2325 Base Elevation: -1991 Thickness: 244
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH, TINOWON FM & MUGGLETON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:2325 Base Elevation: -1991 Thickness: 244
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY: COMBARNGO VOLC Age: CARBONIFEROUS Interpretation Code:Y121
Basal Information: Depth to Base:TD Base Elevation: -2005# Thickness: >60

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SIX MILE 1

REFERENCE # T20 Y1
REFERENCE # T20 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST RES	RDH, CORE + WIRELINE	SG/55-12	26 39'40"S	149 04'20"E	+314	+318	-1319	1637	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
GROVES, R.D. (MINES ADMINISTRATION)
WELL COMPLETION REPORT A.A.R. BLUE HILLS NO.1, A.A.R. SIX MILE NO.1, A.A.R. PADDY WARD NO.1
UNPUBLISHED COMPANY REPORT Q/119P/553. BMR FILE 73/249
Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1375 Base Elevation: -1057 Thickness: 1371
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1460 Base Elevation: -1142 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1549 Base Elevation: -1231 Thickness: 89
Geologic Description: 14% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1549 Base Elevation: -1231 Thickness. 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1582 Base Elevation: -1264 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1613 Base Elevation: -1295 Thickness: 31
Geologic Description: 25% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1628 Base Elevation: -1310 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1628 Base Elevation: -1310 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SHALE, TINOWON FM & MUGGLETON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:1628 Base Elevation: -1310 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY Age: PRE-PERMIAN Interpretation Code:X111
Basal Infor[illegible]:TD Base Elevation: -1319[illegible] Thickness:)9
Geologic Des[illegible]
Reported Env[illegible]
Interpreted E[illegible]
Geologic Features: [illegible]eature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:91 Base Elevation: +127 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:218 Base Elevation: +100 Thickness: 127

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOOGA SST Age: CRETACEOUS Interpretation Code:Y103
Basal Information: Depth to Base:293 Base Elevation: +25 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ORALLO FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:474 Base Elevation: -156 Thickness: 181
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUBBERAMUNDA SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:524 Base Elevation: -206 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:949 Base Elevation: -631 Thickness: 425
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1218 Base Elevation: -900 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1298 Base Elevation: -980 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1309 Base Elevation: -991 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:1387 Base Elevation: -1069 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y111
Basal Information: Depth to Base:1460 Base Elevation: -1142 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:1521 Base Elevation: -1203 Thickness: 61
Geologic Description: DARK BROWN CARBONACEOUS SHALE, DULL BLACK COAL, & TUFF
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1468	-1150	8 CA
COAL INTERVAL	1494	-1176	5 CA
COAL	1503	-1185	5 CA
COAL	1512	-1194	2.5 CA

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5; P3D-4 (AT 1487 M)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1521 Base Elevation: -1203 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:1554 Base Elevation: -1236 Thickness: 33
Geologic Description: HARD LT GY FINELY CARBONACEOUS SILTSTONE & SHALE, SOFT WHITE TUFF, AND DK GR CARBONACEOUS SHALE GRADING TO DULL BLACK COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
WINNATHOOLA COAL MB	1549	-1231	11

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5; P3C ACRITARCH ZONE (AT 1551 M)

STRATIGRAPHY: TINOWON FM Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:1613 Base Elevation: -1295 Thickness: 59
Geologic Description: GY FY FOSSILIFEROUS SLTST + SH, GY QZOSE PY SL CARB SLTST, DK GY-BR CARB SH - DULL BLK SHALY PY COAL, MINOR M-C QZOSE PY SST; SPINES, SHELL FRAG
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MANTUAN PRODUCTUS BD	1573	-1255	18
WALLABELLA COAL MB	1608	-1290	26

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5; P3B (1568-1611 M)

STRATIGRAPHY: MUGGLETON FM EQUIV Age: PERMIAN Interpretation Code:Y117
Basal Information: Depth to Base:1628 Base Elevation: -1310 Thickness: 15
Geologic Description: DARK GREY NON-FISSILE CARBONACEOUS SHALE GRADING TO SILTSTONE, AND MINOR PYRITIC SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5; P3B (AT 1622 M)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y118
Basal Information: Depth to Base:1628 Base Elevation: -1310 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH, TINOWON FM & MUGGLETON FM EQUIV

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y119
Basal Information: Depth to Base:1628 Base Elevation: -1310 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM SUB-GROUP

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y120
Basal Information: Depth to Base:TD Base Elevation: -1319# Thickness:)9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TARA 1

REFERENCE # T31 Y1
REFERENCE # T31 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 20'50"S	150 29'26"E	+318	+322	-1749	2071	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1

GILLUM, J.P., AND CAREY, A.R.
WELL COMPLETION REPORT NO.9, UNION-KERN-A.O.G. TARA NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 62/1307

Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1639 Base Elevation: -1317 Thickness: 1635
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1981 Base Elevation: -1659 Thickness: 342
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2056 Base Elevation: -1734 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: VOLCANICS Age: PRE-PERMIAN Interpretation Code:X1[illegible]
Basal Information: Depth to Base:TD Base Elevation: -1749[illegible] Thickness: [illegible]15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:481 Base Elevation: -159 Thickness: 477
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN W.C.R.

STRATIGRAPHY: RUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:821 Base Elevation: -499 Thickness: 340
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED RUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1204 Base Elevation: -882 Thickness: 383
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1639 Base Elevation: -1317 Thickness: 435
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BUNDAMBA FM IN W.C.R. REPRESENTS UNDIFFERENTIATED HUTTON SST-PRECIPICE SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:2056 Base Elevation: -1734 Thickness: 417
Geologic Description: LT-DK GY SL MICAC CARB SLTST & DK GY MICAC CARB SH WITH GY-GN F QZOSE CALC SST, LT GY VF-GRANULE TFAC SST AND BLACK COAL TOWARDS BASE
Reported Environment: SHALLOW WATER MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 2056 -1734 17
Tectonic Structure:
Remarks DATED AS PERMIAN ON BASIS OF SPORES FROM 1649 M

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1749* Thickness: >15
Geologic Description: BRECCIATED RED-BROWN, APPLE GREEN AND DARK GREEN ANDESITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TAROOM 11-11A

REFERENCE # T7

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-8	25 42'00"S	148 42'00"E	+460	+462	-744	1206	

REFERENCE: HEYWOOD, F.B.
STRATIGRAPHIC DRILLING REPORT-QSO TAROOM 11-11A
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 78 Page 624-629 Publn Year: 1977

Cross Reference: BORE AND LITHOLOGIC LOGS OF TAROOM 11-11A/ FOSTER, C.B., 1977, PERMIAN MIDSPORE ASSEMBLAGES FROM QSO TAROOM 11-11A, QMJ 78 P 634-638

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:TD Base Elevation: -744 m Thickness: >936
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:27 Base Elevation: +435 Thickness: 25
Geologic Description: SLTST AND SS WITH MINOR COAL. FINER GRAINED AT TOP. LT GY TO DK GY AND BLK, LT YEL BN. BDG IS THIN-THICK, LAM AND XBDD. CARB AND PLANT FRG.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, BRIGHT TO DULL 23 +439 (1
Tectonic Structure: DIPS <5 DG
Remarks REWAN GROUP

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:109 Base Elevation: +353 Thickness: 82
Geologic Description: LT PINK,LT YEL, CREAM QZ SS; M-VC GRAINED; THIN-THICK BDD, GRADED AND X-BDD.INTVAL OF INTBDD QZ-SUB-LI SS SLTST MDST; LAM, THIN BDD, CARB.
Reported Environment: HIGH ENERGY FLUVITILE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS <5 DG
Remarks REWAN GROUP. UNCONFORMABLE ON PEAWADDY

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:126 Base Elevation: +336 Thickness: 17
Geologic Description: LT GY-GN TO WH LITHIC-FELD SS. VF GRAINED, FAIR SORTING. MED-THICK BDD. BURROWED, SPARCE MUD CLASTS, ABUND GREEN MINERAL, CARB AND PLANT FRAG.
Reported Environment: SHALLOW WATER MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS <5 DG.
Remarks BLENHEIM SUB-GROUP. UNCONFORMITY AT TOP

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:126 Base Elevation: +336 Thickness: 17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PEAWADDY FM. UNCONFORMITY AT TOP

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:270 Base Elevation: +192 Thickness: 144
Geologic Description: GY-DK GY INTBDD SLTS SS MINOR SH AND COQ; GEN SANDIER TOP MUDDIER BOTTOM. BDG THIN LAM X-LAM-BDD GRADED BIOTURB. MARINE FOSS BURROWS PLANT FOSS
Reported Environment: SHALLOW MARINE TO ESTRUARINE, POSSIBLY DEEPER OR MORE RESTRICTED DURING DEPOSITION OF A MUDSTONE-SHALE INTERVAL BETWEEN 146-164 M.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF, GREEN, V THIN	152	+318	
COQUINITE	192	+276	
CARBONATE, FOSSILIF.	235	+227	

Tectonic Structure: (10 DEG DIP
Remarks PLANT FOSS MORE COMMON IN BOTTOM. BROWN CARBONATE SIDERITE ? REPORTED. UNCONFORMABLE ON REIDS DOME.

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:270 Base Elevation: +192 Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS INGELARA FM. UNCONFORMABLE ON REIDS DOME

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:270 Base Elevation: +192 Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks ANGULAR UNCONFORMITY AT BASE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -744 ± Thickness: >935?
Geologic Description: SLTST SS COAL, LESSER MDST SH CGL IRONSTONE. TOP GREN, THICKER BDD; BOTTOM FINER, THIN BDD-LAM, CGL BDS. PLANT FRAG, SOLE MARKS, FLAME STRUCT.
Reported Environment: LACUSTRINE TO PALUDAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, DULL, BRT BNDS	304	+158	5
COAL, BRIGHT-DULL	439	+23	13
COAL, BRIGHT-DULL	490	-28	3
IRONSTONE (SIDERITE)	593	-131	2

Tectonic Structure: DIPS 5-25 DG. SLICKENSIDES, NORMAL FAULT
Remarks COALS THICK AT TOP, NUM THIN SMS-MIDDLE AND COALY LAM-BOTTOM. MICROFAULTS-DYKES, SOFT SED DEF. THICK CORRECTED 15 DG

CONTROL POINT: TAROOM 12-12A

REFERENCE # T8

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/55-8	25 48'00"S	148 31'00"E	475	475	-404	879	

REFERENCE: HAWKINS, P.J., AND BALFE, P.E.
DEPARTMENTAL STRATIGRAPIC DRILLING IN QUEENSLAND
QUEENSLAND GOVERNMENT MINING JOURNAL V 81 Page 74-109 Publn Year: 1980

Cross Reference: GRAY, A.R.G., 1980, QGMJ V.81, P110-130 JACKSON,K.S., HAWKINS, P.J. AND BENNETT, ARG, 1980, APEA JOURN V.20(1), P143-159

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:763 Base Elevation: -288 Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:831 Base Elevation: -356 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:831 Base Elevation: -356 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING.

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:Y101
Basal Information: Depth to Base:502 Base Elevation: -27 Thickness: 502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:636 Base Elevation: -161 Thickness: 134
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y103

Basal Information: Depth to Base:648 Base Elevation: -173 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:765 Base Elevation: -270 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:831 Base Elevation: -356 Thickness: 66
Geologic Description: CARB SHALE AT 785.18 M DEPTH(JACKSON, ET.AL.,1980)
Reported Environment: FLUVIAL, COAL BEARING(JACKSON, ET.AL.,1980)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SOURCE ROCK ANALYSIS SEE JACKSON ET.AL.,1980

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:831 Base Elevation: -356 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM.

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -404* Thickness:)48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -404* Thickness:)48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -404* Thickness:)48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS BLACK ALLEY SH

CONTROL POINT: TEY 1

REFERENCE # T28 Y1
REFERENCE # T28 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 08'37"S	150 13'31"E	+289	+293	-1345	1638	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1

UNION OIL DEVELOPMENT CORPORATION
PRELIMINARY FINAL REPORT, UNION-KERN-A.O.G. TEY NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1313

Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1629 Base Elevation: -1332 Thickness: 1621
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:TD Base Elevation: -1345± Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y101
Basal Information: Depth to Base:782 Base Elevation: -489 Thickness: 778
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:1149 Base Elevation: -856 Thickness: 367
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1402 Base Elevation: -1109 Thickness: 253
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1518 Base Elevation: -1225 Thickness: 116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1626 Base Elevation: -1333 Thickness: 108
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1345# Thickness:)12
Geologic Description: COAL, BR & GY-BR CARBONACEOUS SHALE, F-PEBBLY GN-GY SST (TUFFACEOUS MATRIX), GY-BR FINELY CARBONACEOUS SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1629 -1336 2 CA
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM "DESCRIPTION OF CUTTINGS"

CONTROL POINT: TINGAN 1

REFERENCE # T44 Y1
REFERENCE # T44 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/56-1	28 25'07"S	150 15'12"E	+208	+213	-1633	1816	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
HERRMANN, F.A.
WELL COMPLETION REPORT NO.16, UNION-KERN-A.O.G. TINGAN NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1314
Page Publn Year: 1963
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1624 Base Elevation: -1411 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1719 Base Elevation: -1506 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1759 Base Elevation: -1546 Thickness: 40
Geologic Description: 0.04% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -1603* Thickness:)57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:473 Base Elevation: -260 Thickness: 468
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1076 Base Elevation: -863 Thickness: 603
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE Fm IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1271 Base Elevation: -1058 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1441 Base Elevation: -1228 Thickness: 170
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1533 Base Elevation: -1320 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1624 Base Elevation: -1411 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1737 Base Elevation: -1524 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CABAWIN FM IN W.C.R.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1775 Base Elevation: -1562 Thickness: 38

Geologic Description: INTBDD M-DK BR FIRM CARB SH, M-DK BR ARG SLTST & GY-GN TFAC TIGHT SST, & LOWER GY-GN GRANULAR-PBLY TFAC CGL UNIT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code: Yi09
Basal Information: Depth to Base: TD Base Elevation: -1603± Thickness:)41
Geologic Description: DK GY M-DK BR SILTY CARB SPOT CALC SH, LT-DK GY SL TFAC SPOT CALC SL CARB SLTST, MINOR LT-M GY GY-GN VF-F WELL SRTD TFAC SST & TFAC CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MARINE FOSSIL FRAGMENTS IN SHALE & SILTSTONE

CONTROL POINT: TOOLOOMBILLA 1

REFERENCE # T11

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PLANET EXPL. CO.	RDH, CORED, WIRELINE	SG/55-7	25 53'40"S	147 57'46"E	+414	+417	-117	534	

REFERENCE: MEYERS, N.A. FOR PLANET OIL COMPANY N.L.
PLANET TOOLOOMBILLA NO.1, A TO P BIP QUEENSLAND, COMPLETION REPORT
PLANET EXPLORATION COMPANY PTY LTD UNPUBL. REPORT BMR FILE 64/4047 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:533 Base Elevation: -116 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPS

STRATIGRAPHY: TRIASSIC Age: TRIASSIC Interpretation Code:X
Basal Information: Depth to Base:533 Base Elevation: -116 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y101
Basal Information: Depth to Base:463 Base Elevation: -46 Thickness: 460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:533 Base Elevation: -116 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRANITE Age: PRE-PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -117 & Thickness: >1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ULA ULA 1

REFERENCE # T42 Y1
REFERENCE # T42 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RCH, CORE + WIRELINE	SH/55-4	28 05'05"S	149 26'41"E	+236	+240	-1953	2193	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
PYLE, D.E., AND DARNEY, J.R.
WELL COMPLETION REPORT, UNION-KERN-A.O.G. ULA ULA NO.1
UNION OIL DEVELOPMENT CORPORATION UNPUBLISHED REPORT
Page Publn Year: 1965
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1880 Base Elevation: -1640 Thickness: 1876
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2101 Base Elevation: -1861 Thickness: 221
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2156 Base Elevation: -1916 Thickness: 55
Geologic Description: 6% COAL. UNIT BECOMES SANDIER TOWARDS BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUGGLETON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2184 Base Elevation: -1944 Thickness: 28
Geologic Description: SANDY UNIT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2184 Base Elevation: -1944 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MUGGLETON FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2184 Base Elevation: -1944 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MUGGLETON FM OF BLENHEIM SUB-GROUP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1953# Thickness:)9
Geologic Description: VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:848 Base Elevation: -608 Thickness: 844
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1481 Base Elevation: -1241 Thickness: 633
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1645 Base Elevation: -1405 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1774 Base Elevation: -1534 Thickness: 129
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN-PRECIPICE Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1880 Base Elevation: -1640 Thickness: 106

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED EVERGREEN FM TO PRECIPICE SST

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:2088 Base Elevation: -1848 Thickness: 208
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:2101 Base Elevation: -1861 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CABAWIN FM IN W.C.R.

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2184 Base Elevation: -1944 Thickness: 83
Geologic Description: WH VF-F QZ ?TFAC SST, WH VF-M ?TFAC SST, M-VC QZ SST, WH TFAC SST, BR CARB SLTST, LT GY SL CARB SLTST, DK GY-BLK CARB SH & COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY INTERVAL	2109	-1869	3 CA
COALY INTERVAL	2121	-1881	4 CA
COAL INTERVAL	2145	-1905	1 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1953# Thickness: >9
Geologic Description: VOLCANIC
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COALY INTERVAL	2109	-1869	3 CA
COALY INTERVAL	2121	-1881	4 CA
COAL INTERVAL	2145	-1905	1 CA

Tectonic Structure:
Remarks

CONTROL POINT : UNDULLA 1

REFERENCE # T30 Y1
REFERENCE # T30 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 13'40"S	150 16'04"E	+287	+291	-2406	2697	?

REFERENCE: X1
THIS REPORT
Page Publn Year:

Cross Reference:

REFERENCE: Y1
HACK, J.E.
WELL COMPLETION REPORT NO.11, UNION-KERN-A.O.G. UNDULLA NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BKR FILE 62/1302
Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1715 Base Elevation: -1424 Thickness: 1711
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2116 Base Elevation: -1825 Thickness: 401
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GYRANDA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2331 Base Elevation: -2040 Thickness: 215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2331 Base Elevation: -2040 Thickness: 616
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM & GYRANDA FM

STRATIGRAPHY: FLAT TOP FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2472 Base Elevation: -2181 Thickness. 141
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARFIELD FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2578 Base Elevation: -2287 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure.
Remarks

STRATIGRAPHY: OXTRACK FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2651 Base Elevation: -2360 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2651 Base Elevation: -2360 Thickness: 320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD & OXTRACK FMS

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2651 Base Elevation: -2360 Thickness: 320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FLAT TOP, BARFIELD & OXTRACK FMS OF BLENHEIM SUB-GROUP

STRATIGRAPHY: CAMBOON ANDESITE Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2406* Thickness:)46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:223 Base Elevation: +68 Thickness: 219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-CUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:890 Base Elevation: -599 Thickness: 667

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1269 Base Elevation: -978 Thickness: 379
Geologic Description
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC [illegible]terpretation Code:Y104
Basal Information: Depth to Base:1502 Base Elevation: -[illegible] Thickness: 233
Geologic Description:
[illegible] Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1645 Base Elevation: -1354 Thickness: 143
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1724 Base Elevation: -1433 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1884 Base Elevation: -1593 Thickness: 160
Geologic Description: INTBDD WH TUFF, GY-BR TFAC CARB SH & SLTST, TAN-BLK CARB SH & SLTST, COAL SEAMS, & MINOR WH M-PEBBLY QZOSE TFAC SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1777	-1486	40 CA
COAL INTERVAL	1804	-1513	9 CA
1853		-1562	31 CA

Tectonic Structure:
Remarks DATED AS PERMIAN ON BASIS OF SPORES FROM 1792 M. GOOD HYDROCARBON SHOW.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2652 Base Elevation: -2361 Thickness: 768
Geologic Description: BR-GY CARB SH, GY TFAC SLTST, OCCAS FOS CALC SH & SLTST WITH INTBDD COAL SEAMS & THIN WH TUFF BEDS (UPPER PART) & MINOR CALC SST (LOWER PART)
Reported Environment: SHALLOW WATER MARINE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL INTERVAL	2117	-1826	173

Tectonic Structure:
Remarks DATED AS PERMIAN ON BASIS OF MACROFOSSILS FROM 2446-2448 M

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:TD Base Elevation: -2406± Thickness: >45
Geologic Description: WEATHERED INTERBEDDED TUFFACEOUS SST, TUFF, RED-BROWN - PURPLISH PROPYLITIZED ANDESITE FLOWS & MINOR BLACK CARBONACEOUS SHALE
Reported Environment: CONTINENTAL; DERIVED FROM A VOLCANIC TERRANE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks SPORES FROM CARBONACEOUS MATERIAL IN CUTTINGS FROM 2673-2676 M WERE DATED AS LOWER PERMIAN

CONTROL POINT: WANDOAN 1

REFERENCE # T17 Y1
REFERENCE # T17 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/55-12	26 10'31"S	149 54'21"E	+292	+298	-2974	3272	?

REFERENCE: BUREAU OF MINERAL RESOURCES
U-K-A. WANDOAN NO. 1, QUEENSLAND OF UNION OIL DEVELOPMENT CORP., KERN COUNTY LAND CO. & AUSTRALIAN OIL AND GAS CORP. LTD
PETROLEUM SEARCH SUBSIDY ACTS PUBLICATION NO. 59 Page Publn Year: 1965

Cross Reference:

REFERENCE: X1
THIS REPORT Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1076 Base Elevation: -778 Thickness: 1076
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1468 Base Elevation: -1170 Thickness: 392
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:2830 Base Elevation: -2532 Thickness: 1362
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARALABA CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:3155 Base Elevation: -2057 Thickness: 325
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CYRANDA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2974# Thickness: >117
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2974 Thickness: >442
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BARALABA CM & GYRANDA FM

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:534 Base Elevation: -236 Thickness: 529
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:798 Base Elevation: -500 Thickness: 264
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:963 Base Elevation: -665 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1076 Base Elevation: -778 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1468 Base Elevation: -1170 Thickness: 392
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:2830 Base Elevation: -2532 Thickness: 1362

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -2974' Thickness:)442
Geologic Description: CARB SH, SHALY COAL, CALC SST, TFAC SST, TF, COAL, CARB MICAC SH, TFAC SST, TF, CARB SH, COAL, TF, COAL, TF, COAL, CARB TFAC SLTST, TFAC QZ SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL T'OUT
Tectonic Structure:
Remarks AGE - FROM PALYNOLOGY: CLOSE TO PERMIAN-TRAISSIC B'DARY (AT 2941 M), UPPER PERMIAN (AT 3180 M)

CONTROL POINT: WARRIGABIE 1

REFERENCE # T37

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	RDH, CORE + WIRELINE	SG/56-13	27 56'45"S	150 15'37"E	+245	+249	-1430	1679	

REFERENCE: UNION OIL DEVELOPMENT CORPORATION
PRELIMINARY FINAL REPORT, UNION-KERN-A.O.G. WARRIGABIE NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 64/4067 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:381 Base Elevation: -132 Thickness: 377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN W.C.R.

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1046 Base Elevation: -797 Thickness: 665
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1305 Base Elevation: -1056 Thickness: 259
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1476 Base Elevation: -1227 Thickness: 171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1595 Base Elevation: -1346 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:1636 Base Elevation: -1387 Thickness: 41

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1430± Thickness: >43
Geologic Description: LT GY F SST, LT-M-DK BR CARB SLTST, GY-BR CARB SHALE (TRACE PLANT REMAINS), GN CGL TFAC SST, GN CGL (REWORKED ANDESITIC VOLCS)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WARRONG 1

REFERENCE # T1 Y1
REFERENCE # T1 Y2
REFERENCE # T1 Y3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PLANET OIL CO.	RDH	SG/55-7	25 09'46"S	147 53'37"E	+623	+625	-466	1091	?

REFERENCE: Y1 MEYERS, N.A.
PLANET WARRONG NO. 1 A, TD P 81P QUEENSLAND, COMPLETION REPORT
PLANET OIL COMPNAY N.L. UNPUBL. REPORT (BMR FILE 64/4064) Page Publn Year: 1964
Cross Reference:

REFERENCE: Y2 GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF PERMIAN STRATA IN THE SOUTHERN DENISON TROUGH
QUEENSLAND GOVERNMENT MINING JOURNAL, 81 Page 110-130 Publn Year: 1980
Cross Reference:

REFERENCE: Y3 DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130 Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: TRIASSIC Age: TRASSIC Interpretation Code:X
Basal Information: Depth to Base:630 Base Elevation: -5 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUES USED FOR CONTOUR MAPPING

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:651 Base Elevation: -26 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X
Basal Information: Depth to Base:651 Base Elevation: -26 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROJECT INTERPRETATION. VALUE USED FOR CONTOUR MAPPING

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:157 Base Elevation: +468 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:561 Base Elevation: +64 Thickness: 404
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:651 Base Elevation: -26 Thickness: 90
Geologic Description: INTBDD GN-GY MICAC CARB SH, WH-LT GY M-C QZOSE SST, MINOR LT GY FINELY ARGN SLTST AND DULL BLK COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 651 -26 23
Tectonic Structure:
Remarks CALLED "UPPER BANDANNA" IN COMPLETION REPORT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:651 Base Elevation: -26 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:722 Base Elevation: -97 Thickness: 71
Geologic Description: INTBDD GY-DK GY MICAC MOD-SL CARB SH AND ASHY CALC TUFF AND TFAC SH WITHBROWN MICA AND VOLCANIC GLASS SHARDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "LOWER BANDANNA" IN COMPLETION REPORT

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:848 Base Elevation: -223 Thickness: 126
Geologic Description: INTBDD GY-BR F-M SILTY QZ-LI SST - ARGN SH, M-DK GY SILTY SANDY SH, ASHYTF AND TFAC SH, LT GY-GY F (IN PART CGL) QZ SST, PBL CGL, MARINE FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: AVG DIP 3 DEGS
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:848 Base Elevation: -223 Thickness: 197
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:848 Base Elevation: -223 Thickness: 197
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM OF BLENHEIM SUB-GP

STRATIGRAPHY: UNDIFFERENTIATED Age: CARBONIFEROUS Interpretation Code:Y189
Basal Information: Depth to Base:TD Base Elevation: -466 ± Thickness:)243
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:630 Base Elevation: -5 Thickness: 628
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:722 Base Elevation: -97 Thickness: 92
Geologic Description:
Reported Environment: DEPOSITION REPRESENTS GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:848 Base Elevation: -223 Thickness: 126
Geologic Description:
Reported Environment: SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:848 Base Elevation: -223 Thickness: 218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:848 Base Elevation: -223 Thickness: 218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM OF BLENHEIM SUB-GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y206

Basal Information: Depth to Base:TD Base Elevation: -466 # Thickness:)243
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-TRIASSIC Age: JURASSIC-CRET Interpretation Code:Y301
Basal Information: Depth to Base:157 Base Elevation: +468 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y302
Basal Information: Depth to Base:628 Base Elevation: -3 Thickness: 471
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:651 Base Elevation: -26 Thickness: 23
Geologic Description:
Reported Environment: FLUVIAL, LACUSTRINE, OR PALUDAL (P.126)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure.
Remarks THESE UNIT PICKS USED FOR STRUCTURE AND ISOPACH MAPS.

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:849 Base Elevation: -224 Thickness: 198
Geologic Description:
Reported Environment: MARINE (P.55)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF UNIDFFERENTIATED BLENHEIM SUB-GP

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:849 Base Elevation: -224 Thickness: 198
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF UNDIFFERENTIATED BLENHEIM SUB-GP

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:TD Base Elevation: -466 # Thickness:)242
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : WEIR 1

REFERENCE # T35

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/56-13	27 51'52"S	150 25'11"E	+269	+273	-1322	1595	

REFERENCE: UNION OIL DEVELOPMENT CORPORATION
PRELIMINARY FINAL REPORT, UNION-KERN-A.O.G. WEIR NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1316 Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:268 Base Elevation: +5 Thickness: 264
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN REFERENCE

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:863 Base Elevation: -590 Thickness: 595
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN REFERENCE. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1166 Base Elevation: -893 Thickness: 303
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN REFERENCE.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1366 Base Elevation: -1093 Thickness: 200
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1490 Base Elevation: -1217 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:1562 Base Elevation: -1289 Thickness: 72

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1322' Thickness:)33
Geologic Description: BR & GY-BR SH (CARB LAM & STREAKS), GY & GN GY SLTST (CARB STREAKS) & GN-WH M-PBLY SST (CONTAINING QZ AND TUFF GRAINS) & MINOR VF-F QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM DESCRIPTIONS OF CUTTINGS & SIDEWALL CORES

CONTROL POINT: WERIBONE 1

REFERENCE # T26

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SG/55-16	27 19'38"S	149 21'02"E	+335	+340	-2097	2437	

REFERENCE: MACK, J.E., AND HERRMANN, F.A.
WELL COMPLETION REPORT NO.13, UNION-KERN-A.O.G. WERIBONE NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED REPORT. BMR FILE 63/1008 Page Pr'ln Year: 1963

Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:696 Base Elevation: -356 Thickness: 691
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-CUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1386 Base Elevation: -1046 Thickness: 690
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENT BUNGIL FM TO CUBBERAMUNDA SST

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1612 Base Elevation: -1272 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1811 Base Elevation: -1471 Thickness: 199
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1991 Base Elevation: -1651 Thickness: 180
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDOAN FM Age: TRIASSIC Interpretation Code:X106
Basal Information: Depth to Base:2179 Base Elevation: -1839 Thickness: 188

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X107
Basal Information: Depth to Base:2270 Base Elevation: -1930 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2365 Base Elevation: -2025 Thickness: 95
Geologic Description: GREY, BROWN & BLACK CARBONACEOUS SHALE INTERBEDDED WITH VOLCANIC ASH & TUFF, BROWN-BLACK SOFT COAL AND MINOR SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAMS T'OUT <3.7
Tectonic Structure:
Remarks COAL BEDS ARE EVENLY DISTRIBUTED T'OUT THE FORMATION; TOTAL OF 27 M OF COAL

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:X189
Basal Information: Depth to Base:TD Base Elevation: -2097# Thickness: >72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WERRINA 2

REFERENCE # T49 X1
REFERENCE # T49 Y1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HARBOURSIDE-ADC	RDH, CORE + WIRELINE	SH/55-4	28 47'49"S	149 24'00"E	+175	+179	-1388	1567	?

REFERENCE: X1 WOOLDRIDGE, P.
A.O.G. - HARBOURSIDE WERRINA-2 WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 69/2011 Page Publn Year: 1969
Cross Reference:

REFERENCE: Y1 EXON, N.F.
GEOLOGY OF THE SURAT BASIN IN QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 166, VOLUME 2 (MAPS) Page PLATE 4 Publn Year: 1976
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:X101
Basal Information: Depth to Base:52 Base Elevation: +127 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X102
Basal Information: Depth to Base:753 Base Elevation: -574 Thickness: 701
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN W.C.R.

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:X103
Basal Information: Depth to Base:1224 Base Elevation: -1045 Thickness: 471
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN W.C.R. REPRESENTS UNDIFFERENTIATED BUNGIL FM TO GUBBERAMUNDA SST

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1324 Base Elevation: -1145 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1436 Base Elevation: -1257 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:X106

Basal Information: Depth to Base:1478 Base Elevation: -1299 Thickness: 42

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

STRATIGRAPHY: WANGOAN FM Age: TRIASSIC Interpretation Code:X107

Basal Information: Depth to Base:1547 Base Elevation: -1368 Thickness: 69

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks CONSISTS OF WANGOAN, HOOLAYENBER AND CLEMATIS FORMATIONS OF W.C.R.

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:X108

Basal Information: Depth to Base:TD Base Elevation: -1388? Thickness: 120

Geologic Description: LIGHT GREY TO GREENISH, BROWN, DENSE TUFF WITH WELL-FORMED CRYSTAL INCLUSIONS COMMON TO ABUNDANT

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101

Basal Information: Depth to Base:466 Base Elevation: -287 Thickness: 462

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

STRATIGRAPHY: BUNGIL FM Age: CRETACEOUS Interpretation Code:Y102

Basal Information: Depth to Base:735 Base Elevation: -556 Thickness: 269

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

STRATIGRAPHY: HOOGH SST Age: CRETACEOUS Interpretation Code:Y103

Basal Information: Depth to Base:783 Base Elevation: -604 Thickness: 48

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

STRATIGRAPHY: ORALLO FM Age: JURASSIC Interpretation Code:Y104

Basal Information: Depth to Base:956 Base Elevation: -777 Thickness: 173

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUBBERAMUNDA SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:997 Base Elevation: -818 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1225 Base Elevation: -1046 Thickness: 228
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1320 Base Elevation: -1141 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1436 Base Elevation: -1257 Thickness: 116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1545 Base Elevation: -1366 Thickness: 109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1388* Thickness:)22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WESTGRC E 3

REFERENCE # T4 Y1
REFERENCE # T4 Y2
REFERENCE # T4 Y3
REFERENCE # T4 Y4
REFERENCE # T4 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORED, WIRELINE	SG/55-7	25 34'00"S	148 26'00"E	+524	+528	-3332	3860	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.A.O. WESTGROVE NO.3 WELL, QLD. WELL COMPLETION REPORT
ASSOC. AUST. OILFIELDS N.L. UNPUBL. REPORT Q/55-SEP/119 BMR FILE 62/1303
Page Publn Year: 1963
Cross Reference:

REFERENCE: Y2
GRAY, A.R.G.
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SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:425 Base Elevation: +103 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:503 Base Elevation: +25 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:503 Base Elevation: +25 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERMAN CREEK FM Age: PERMIAN Interpretation Code:X139
Basal Information: Depth to Base:634 Base Elevation: -106 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTITY OF UNIT UNCERTAIN

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:X140
Basal Information: Depth to Base:778 Base Elevation: -250 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:X150
Basal Information: Depth to Base:853? Base Elevation: -325? Thickness: 75?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:X160
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 237?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:X165
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 237?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:X170
Basal Information: Depth to Base:TD Base Elevation: -3332# Thickness: >2770
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y181
Basal Information: Depth to Base:232 Base Elevation: +296 Thickness: 228

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:425 Base Elevation: +183 Thickness: 193
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:503 Base Elevation: +25 Thickness: 78
Geologic Description: INTBDD FINE SST, SILTSTONE AND MINOR COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	427	+101	2.5
COAL INTERVAL	457	+71	25
COAL	473	+55	3.8

Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF UPPER PART OF 'BANDANNA FM' OF COMPLETION REPORT

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:503 Base Elevation: +25 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM. DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:594 Base Elevation: -66 Thickness: 91
Geologic Description: DK GREY-BLACK CARBONACEOUS SHALE WITH MINOR INTERBEDS OF V SOFT WHITE AND PINK ?TUFFACEOUS SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF LOWER PART OF "BANDANNA FM" OF COMPLETION REPORT

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:778 Base Elevation: -250 Thickness: 184
Geologic Description: MUDSTONE, SHALE, LIMESTONE AND MINOR COAL AND SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO "MANTUAN PRODUCTUS BED" AND "DRY CREEK SH" OF COMPLETION REPORT

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:778 Base Elevation: -250 Thickness: 275
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: CATHERINE SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:799 Base Elevation: -271 Thickness: 21
Geologic Description: CONGLOMERATIC SST WITH PEBBLES OF QZ, QZITE, HARD SILTSTONE AND MUDSTONE AND SANDY ARGILLACEOUS PYRITIC SILTSTONE MATRIX
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "EARLY STORMS SST" IN COMPLETION REPORT

STRATIGRAPHY: UNIT 5 Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:840 Base Elevation: -312 Thickness: 41
Geologic Description: GREY SANDY ARG SLTST WITH MINOR SST AND SHALE; MARINE MACROFOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNIT 6 Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:930 Base Elevation: -402 Thickness: 90
Geologic Description: WH M-C WELL SRTD MASSIVE QZOSE (WITH MINOR FELDSPAR AND A FEW LI AND CARB GRAINS) SST WITH WH ARG MATRIX; PROBABLY BEEN REWORKED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNIT 7 Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 160
Geologic Description: SHALE, MUDSTONE AND SANDY MUDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNIT 8 Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -3332# Thickness: >2770
Geologic Description: BR-GY M-C POORLY BDD OR MASSIVE QZOSE LI FLD MICAC SL CARB SST, BR-GY ARG MICAC CARB SLTST, COAL, DK GY-DK BR CARB SH; PY AT BASE; PLT FRAGS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1121 -593 31
Tectonic Structure:
Remarks COAL SEAMS THROUGHOUT

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:425 Base Elevation: +103 Thickness: 421
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y202

Basal Information: Depth to Base:472 Base Elevation: +56 Thickness: 47
Geologic Description:
Reported Environment: PALUDAL AND LACUSTRINE CONDITIONS DURING MAJOR REGRESSION (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:472 Base Elevation: +56 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:594 Base Elevation: -66 Thickness: 122
Geologic Description:
Reported Environment: GRADATIONAL CHANGE FROM MARINE TO FRESHWATER CONDITIONS (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:656 Base Elevation: -128 Thickness: 62
Geologic Description:
Reported Environment: SHALLOW MARINE WATER (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:656 Base Elevation: -128 Thickness: 184
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:778 Base Elevation: -250 Thickness: 122
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1020 Base Elevation: -492 Thickness: 242
Geologic Description:
Reported Environment: DEPOSITED DURING EXTENSIVE REGRESSION; LOWER BEDS MARINE IN PART (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1020 Base Elevation: -492 Thickness: 364
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 70
Geologic Description:
Reported Environment: MAJOR MARINE TRANSGRESSION (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y212
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 618
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -3332# Thickness: >2770
Geologic Description:
Reported Environment: DEPOSITED DURING INITIAL SUBSIDENCE OF THE DENISON TROUGH (P.114)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-TRIASSIC Age: POST-TRIASSIC Interpretation Code:Y301
Basal Information: Depth to Base:232 Base Elevation: +296 Thickness: 228
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y302
Basal Information: Depth to Base:425 Base Elevation: +103 Thickness: 193
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:524 Base Elevation: +4 Thickness: 99
Geologic Description:
Reported Environment: FLUVIAL, LACUSTRINE OR PALUDAL (P.126)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:594 Base Elevation: -66 Thickness: 70
Geologic Description:
Reported Environment: TRANSITION FROM MARINE TO FRESHWATER CONDITIONS, PROBABLY DEPOSITED IN COLD STAGNAT BRACKISH WATER (P.55)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:799 Base Elevation: -271 Thickness: 265
Geologic Description:
Reported Environment: MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:799 Base Elevation: -271 Thickness: 275
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y307
Basal Information: Depth to Base:1021 Base Elevation: -493 Thickness: 222
Geologic Description:
Reported Environment: MAINLY DELTAIC (P.119)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y308
Basal Information: Depth to Base:1021 Base Elevation: -493 Thickness: 222
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ALDEBARAN SST

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y309

Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 69
Geologic Description:
Reported Environment: MARINE (P.118)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y310
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y311
Basal Information: Depth to Base:1090 Base Elevation: -562 Thickness: 566
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y312
Basal Information: Depth to Base:TD Base Elevation: -3332± Thickness: >2770
Geologic Description:
Reported Environment: DOMINANTLY NON-MARINE (P.32)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y401
Basal Information: Depth to Base:232 Base Elevation: +296 Thickness: 228
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y402
Basal Information: Depth to Base:424 Base Elevation: +104 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y403
Basal Information: Depth to Base:524 Base Elevation: +4 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y404
Basal Information: Depth to Base:524 Base Elevation: +4 Thickness: 180
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDAKNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y405
Basal Information: Depth to Base:592 Base Elevation: -64 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y406
Basal Information: Depth to Base:656 Base Elevation: -128 Thickness: 64
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y407
Basal Information: Depth to Base:656 Base Elevation: -128 Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y408
Basal Information: Depth to Base:778 Base Elevation: -250 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:Y409
Basal Information: Depth to Base:930 Base Elevation: -402 Thickness: 152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y410
Basal Information: Depth to Base:930 Base Elevation: -402 Thickness: 274
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM AND UNDIFFERENTIATED EARLY PERMIAN

STRATIGRAPHY: CATTLE CREEK FM Age: PERMIAN Interpretation Code:Y411
Basal Information: Depth to Base:1088 Base Elevation: -560 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CATTLE CK FM THICKEST ON CREST OF WESTGROVE ANTICLINE; WESTGROVE 3 LOCATED NEAR CREST OF ANTICLINE

STRATIGRAPHY: TIVERTON SUB-GP Age: PERMIAN Interpretation Code:Y412
Basal Information: Depth to Base:1088 Base Elevation: -560 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CATTLE CREEK FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y413
Basal Information: Depth to Base:1088 Base Elevation: -560 Thickness: 564
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM, GEBBIE AND TIVERTON SUB-GROUPS AS ABOVE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y414
Basal Information: Depth to Base:TD Base Elevation: -3332% Thickness:)2772
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WOMBLEBANK 1

REFERENCE # T1@ Y1
REFERENCE # T1@ Y2
REFERENCE # T1@ Y3
REFERENCE # T1@ X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RDH	SG/55-7	25 47'35"S	148 11'35"E	+519	+524	-825	1349	?

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QUEENSLAND GOVERNMENT MINING JOURNAL, 81
Page 150-161 Publn Year: 1980
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Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X110
Basal Information: Depth to Base:1063 Base Elevation: -539 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:1079 Base Elevation: -555 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:1079 Base Elevation: -555 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:1063 Base Elevation: -539 Thickness: 1058

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1125 Base Elevation: -601 Thickness: 62
Geologic Description:
Reported Environment: GRADATIONAL CHANGE FROM MARINE TO FRESHWATER (P.125)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1155 Base Elevation: -631 Thickness: 30
Geologic Description:
Reported Environment: SHALLOW MARINE WATER (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1155 Base Elevation: -631 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1228 Base Elevation: -704 Thickness: 73
Geologic Description:
Reported Environment: MODERATELY SHALLOW MARINE (P.123)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: ALDEBARAN SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1265 Base Elevation: -741 Thickness: 37
Geologic Description:
Reported Environment: DEPOSITED DURING EXTENSIVE REGRESSION; LOWER BEDS MARINE IN PART (P.115)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1265 Base Elevation: -741 Thickness: 110
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM AND ALDEBARAN SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1265 Base Elevation: -741 Thickness: 292
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND GEBBIE SUB-GROUPS AS ABOVE

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -825 * Thickness: >84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y201
Basal Information: Depth to Base:708 Base Elevation: -184 Thickness: 703
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1064 Base Elevation: -540 Thickness: 356
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1079 Base Elevation: -555 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BANDANNA FM THICKENS BETWEEN THIS WELL AND AAO GLENTULLOCH 1 (P.157)

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:1079 Base Elevation: -555 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1128 Base Elevation: -604 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1156 Base Elevation: -632 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PEAWADDY FM THICKENS BETWEEN THIS WELL AND AAO GLENTULLOCH 1 (P.157)

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1156 Base Elevation: -632 Thickness: 77
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLACK ALLEY SH AND PEAWADDY FM

STRATIGRAPHY: INGELARA FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1169 Base Elevation: -645 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INGELARA FM THICKENS CONSIDERABLY BETWEEN AAO WONGLEBANK 1 AND AAO GLENTULLOCH 1 (P.157)

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1268 Base Elevation: -744 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1268 Base Elevation: -744 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF INGELARA FM AND UNDIFFERENTIATED EARLY PERMIAN

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1268 Base Elevation: -744 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM AND GEBBIE SUB-GROUPS AS ABOVE

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -825 ± Thickness: >81

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y301
Basal Information: Depth to Base:1061 Base Elevation: -537 Thickness: 1056
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TR3 MICROFAUNA AT 716, 792, 867, 953, 985, 1015 M DEPTHS

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y302
Basal Information: Depth to Base:1125 Base Elevation: -601 Thickness: 64
Geologic Description: UPPER 18 M OF SHALE AND SILTSTONE. LOWER PART TUFF-BEARING. LIMESTONE IN BOTTOM 6 M.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PD3 TO P4 MICROFAUNA AT 1067, 1082, AND 1113 M DEPTH

STRATIGRAPHY: MANTUAN PRODUCTUS BD Age: PERMIAN Interpretation Code:Y303
Basal Information: Depth to Base:1136 Base Elevation: -612 Thickness: 11
Geologic Description: 3 LIMESTONE BEDS BETWEEN 1119 AND 1137 M DEPTH. TUFFS IN LOWER 5 M.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks P3C ASSEMBLAGE AT 1128 M DEPTH.

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y304
Basal Information: Depth to Base:1136 Base Elevation: -612 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INTERVAL ASCRIBED TO MANTUAN PRODUCTUS BED IN WELL REPORT

STRATIGRAPHY: UNDIFF BACK CREEK GP Age: PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:1169 Base Elevation: -645 Thickness: 33
Geologic Description: LIMESTONE AT TOP. INTERVAL 1119-1137 M CONTAINS TUFFS AND SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
TUFFS THROUGHOUT
Tectonic Structure:
Remarks P3B ASSEMBLAGE AT 1143 M DEPTH

STRATIGRAPHY: ALDERAAN SST Age: PERMIAN Interpretation Code:Y306
Basal Information: Depth to Base:1266 Base Elevation: -742 Thickness: 97
Geologic Description: SANDSTONE AND SHALE, MINOR LIMESTONE AND TUFF. BELOW LST AT TOP,SEQUENCEIS >50% SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
LIMESTONE 1176 -652 6

	TUFF INTERVAL	1177	-653	B
	INFERRED COAL (TOP)	1201	-677	
	MINOR TUFFS (TOP)	1219	-695	

Tectonic Structure:
Remarks P3B ASSEMBLAGES AT 1173 AND 1189 M DEPTH; P3A AT 1234, 1250, AND 1265 M.

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y387
Basal Information: Depth to Base:1266 Base Elevation: -742 Thickness: 205
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES BLACK ALLEY SH, MANTUAN PRODUCTUS BD (PEAWADDY), UNDIFFERENTIATED BACK CREEK, AND ALDEBARAN SS

STRATIGRAPHY: TIMBURY HILLS FM Age: DEVONIAN Interpretation Code:Y388
Basal Information: Depth to Base:TD Base Elevation: -825 # Thickness:)83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YARRILL CREEK 1

REFERENCE # T38 Y1
REFERENCE # T38 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNION-KERN-A.O.G	RDH, CORE + WIRELINE	SH/56-1	28 04'42"S	150 25'16"E	+277	+281	-1104	1385	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
GILLUM, J.P.
WELL COMPLETION REPORT NO.7, UNION-KERN-A.O.G. YARRILL CREEK NO.1
UNION OIL DEVELOPMENT CORP. UNPUBLISHED RPORT. BMR FILE 62/1120
Page Publn Year: 1962
Cross Reference:

SEDIMENTARY BASIN: BOWEN, SUB-SURAT

STRATIGRAPHY: SURAT BASIN SEQUENCE Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1088 Base Elevation: -807 Thickness: 1084
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1125 Base Elevation: -844 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: CARBONIFEROUS Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -1104* Thickness:)260
Geologic Description: VOLCANICLASTIC SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:352 Base Elevation: -71 Thickness: 348
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNGIL-GUBBERAMUNDA Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:636 Base Elevation: -355 Thickness: 284
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:829 Base Elevation: -548 Thickness: 193
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1122 Base Elevation: -841 Thickness: 293
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KUTTUNG FM Age: CARB-PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -1104* Thickness: >263
Geologic Description: VOLCANIC & QUARTZOSE CLASTICS LARGELY SILICIFIED & INTERBEDDED WITH TUFFS. MINOR SHALE, SILTSTONE & COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SPORES FROM 1221 M ARE MIDDLE CARBONIFEROUS

GUNNEDAH

BASIN

CONTROL POINT: BAERAMI CREEK DDH 1

REFERENCE # G44

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRLINE	SI/56-1	32 28'33"S	150 29'19"E	174	175	-293	468	

REFERENCE: HOLMES, G.G.
GOULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:80 Base Elevation: +95 Thickness: 19
Geologic Description: VF-M SANDSTONE. LT GY TO BN. XBDD, MASSIVE, SLABBY TOWARDS BASE. SLTST AND CLST LAM, CARB WISPS AND PARTINGS. SPORADIC PLANT FOSS, WORM BURROWS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:80 Base Elevation: +95 Thickness: 79
Geologic Description: INTBDD-LAMD SLTST SST CLST COAL; THIN MDST BDS-LAM, DK GN-GY IGNEOUS ROCK. MICRO-XBDD, CHURNED, CARB-COALY PART, FRIABLE, FISSILE. PLANT FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	38	+137	1.39
IGENOUS ROCK	60	+115	2.43
COAL	61	+114	4.06

Tectonic Structure:
Remarks: WORM BURROWS, MDST-CLST CLASTS, SID, TFAC. IGNEOUS ROCK IN SM 2. GEN COARSENS DOWN. SLTST DOMENANT TOP, SST IN BOTTOM

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:134 Base Elevation: +41 Thickness: 72
Geologic Description: INTBDD-LAM SLTST AND F SST WITH LESSER MDST CLST COAL AND M-C SST. CHURNED BDG, MICRO-XBG, CARB WISPS AND PART. MUD CRACKS, COMMON WORM BURROWS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure: MINOR MICROFAULTS, SLICKENSIDES
Remarks: PLANT REMAINS, SID REPLACEMENT. FLAGGY-FISSILE. TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:451 Base Elevation: -276 Thickness: 317
Geologic Description: INTBDD-LAMD F-M SST SLTST CLST MDST COAL AND IGNEOUS ROCK. XBDD, MICRO-XBDD, BIOTURB. MUDCRACKS, CARB-COALY PART, WORM AND ROOT BURROWS,S PLANTS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 4	149	+26	3.68
COAL, SM 16	332	-157	2.6
IGNEOUS ROCK, COAL	357	-182	5.66
COAL SM 19, INTRUDED	394	-219	15.24

Tectonic Structure:
Remarks: OTHER COAL SMS PRESENT, SOME INTRUDED AND BAKED BY IGNEOUS ROCK. DENMAN FM AT TOP. COAL SM 19 IS BAYSWATER SM.

STRATIGRAPHY: DINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:451 Base Elevation: -276 Thickness: 450
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM FM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -293 m Thickness: >17
Geologic Description: M-DK GREY MUDSTONE WITH NUM TF&C CLST INTBDS, SLTST LAM, SPORADIC PLANT FRAGMENTS, SID AND CALC REPLACEMENT ZONES WITH CONE-IN-CONE, PY NODULES.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -293 m Thickness: >17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE

CONTROL POINT: BAERAMI CREEK DDH 2

REFERENCE # 643

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 33'39"S	150 26'12"E	217	218	-142	360	

REFERENCE: HOLMES, G.G.
GOULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:58 Base Elevation: +160 Thickness: 57
Geologic Description: M-DK GREY MDST AND VF-F SST, MINOR M-C SST AND COAL. INTEDD-LAND, BIOTURB, IRON RICH BANDS, CLST AND SLTST LAM. SID ZONES, PLANTS, CARB IN BASE.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM.

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:347 Base Elevation: -129 Thickness: 346
Geologic Description: F-M SST SLTST MDST CLST AND COAL, M-C SST AND CGL, IGNEOUS ROCK. LAMD AND BIOTURB, SOME MASS AND XBDD. CARB-COALY PART, PLANTS, MINOR ROOTS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	101	+117	1.67
IGNEOUS ROCK, COAL	175	+43	3
COAL	257	-39	2
COAL, BAYSWATER SM	293	-75	4.84

Tectonic Structure:
Remarks IRON RICH BANDS AND LAM, TFAC, ARGIL. 17 OTHER COAL SMS PRESENT. DENMAN FM AT TOP.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:347 Base Elevation: -129 Thickness: 346
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WITTINGHAM CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -142 * Thickness:)13
Geologic Description: LAMD SANDY SILTSTONE WITH CARB PARTINGS AND DK GY MUDSTONE IN BOTTOM 9M WITH PY AND IRON-RICH BANDS AND LAM, CARBONATE REPLACEMENT.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -142 * Thickness:)13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS MULBRING SILTSTONE

CONTROL POINT: BANDO DDH 1

REFERENCE # C12

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-16	31 10'15"S	149 53'50"E	303	303	-687.1	990.10	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:53 Base Elevation: +251 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:113 Base Elevation: +190 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:202 Base Elevation: +101 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:324 Base Elevation: -22 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:465 Base Elevation: -166 Thickness: 5.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:659 Base Elevation: -355 Thickness: 335

Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, UNNAMED SM (1)	414.53	-112	5.08
	COAL, UNNAMED SM (4)	425.24	-123	6.65
	COAL,HOSKISSONS(5.6)	459.47	-156	8.0
	INTRUSION	546	-243	72

Tectonic Structure:
Remarks: COAL SM ALSO AT 330.6M DEPTH, 3.76M THICK

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:698 Base Elevation: -395 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:858 Base Elevation: -554 Thickness: 160
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	INTRUSION	778	-448	46

Tectonic Structure:
Remarks: THICKNESS INCLUDES 46M INTRUSION,BASE AT 778M

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:956 Base Elevation: -653 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, UNNAMED SM (8)	865.95	-563	2.0
	COAL, UNNAMED SM(11)	922.8	-620	4.78

Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -687.1 Thickness:)34.1
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	INTRUSION	TD	-687	)2

Tectonic Structure:
Remarks: THICKNESS INCLUDES 2METRER INTRUSION AT BASE. HOLE TERMINATED IN THIS UNIT.

CONTROL POINT: BENELABRI DDH 1

REFERENCE # G7

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/56-9	30 57'45"S	150 00'20"E	300	300	-300.2	600.2	

REFERENCE: Y101

DATA SUPPLIED BY NSW DEPARTMENT OF MINERAL RESOURCES

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:74 Base Elevation: +226 Thickness: 74 #
Geologic Description: SANDSTONE-SILTSTONE LAMINITE AND SILTSTONE WITH RIPPLES AND FINE CROSS BEDDING
Reported Environment: INTERTIDAL MUDFLATES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT FULL SECTION : HOLE PRECOLLARED INTO SOIL OVER WEATHERED NAPPERBY FM

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:92.5 Base Elevation: +207.5 Thickness: 18.5
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:197.5 Base Elevation: +102.5 Thickness: 7.7
Geologic Description: INTERMIXED SILTSTONE AND FINE-MED. GRAINED QUARTZ-LITHIC SANDSTONE WITH ABUNDANT BURROWING
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK FORMATION

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:231.5 Base Elevation: +68.5 Thickness: 139
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HOSKISSONS (3)	188.4	+111.6	6.4
COAL, MELVILLES (4)	225.6	+74.4	2.5

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:454 Base Elevation: -154 Thickness: 223 #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSION	373	-73	63

Tectonic Structure:
Remarks # INCLUDES 63 METRE INTRUSION WITH BASE AT 373 METRES

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:515 Base Elevation: -215 Thickness: 61
Geologic Description: SILTY SANDSTONE WITH ABUNDANT DROPPED PEBBLES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAULES CREEK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:584 Base Elevation: -284 Thickness: 69
Geologic Description: CONGLOMERATE,SANDSTONE AND COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, UNNAMED SM (5)	517.3	-217.3	2.2
COAL, UNNAMED SM (6)	519.5	-219.5	1.6
COAL, UNNAMED SM (8)	581.1	-281.1	2.9

Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:594.5 Base Elevation: -294.5 Thickness: 10.5
Geologic Description: PELLETOIDAL CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGABRI VOLCANICS Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -300.2 Thickness: >5.7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * NOT PENETRATED T.DEPTH 600.2 METRES

CONTROL POINT: BOMERA DDH 1

REFERENCE # G24

Organisation	Type	Mapno	Lat	Long	Surf El	Pef El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-16	31 23'47"S	149 52'51"E	360	360	-395.9	755.9	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1992

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:222 Base Elevation: +138 Thickness: 222
Geologic Description: INTERMEDIATE AND ALKALINE LAVA AND PYROCLASTIC BRECCIA
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:378 Base Elevation: -18 Thickness: 156
Geologic Description: SILTSTONE, SILTSTONE-SANDSTONE LAMINITE AND MINOR SANDSTONE
Reported Environment: BAY SILT TO TIDAL-INTERTIDAL MUDFLAT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:591 Base Elevation: -231 Thickness: 213
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE,LITHIC SANDSTONE,MINOR TUFF AND COAL
Reported Environment: FLUVIAL CONGLOMERATE AND SANDSTONE MINOR COAL SWAMPS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:708 Base Elevation: -348 Thickness: 8.8
Geologic Description: SILTY,QUARTZ-LITHIC SANDSTONE,BURROWED AND BIOTURBATED
Reported Environment: TOP UNIT OF MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES CORRELATES WITH BULGA FM.-ARCHERFIELD SANDSTONE

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:739 Base Elevation: -379 Thickness: 148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL,UNCORRELATED(4)	623.1	-263.1	3.7
COAL,UNCORRELATED(9)	681.5	-321.5	5.9
COAL, HOSKISSONS(11)	693.6	-333.6	6.1

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:* Base Elevation: Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * NOT PENETRATED

CONTROL POINT: BOOYAMURNA DDH 1

REFERENCE # G31

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH +WIRELINE LOGS	SH 55-16	31 45'30"S	149 51'10"E	598.0	598.0	-100.0	698.0	

REFERENCE: Y1

DATA SUPPLIED BY THE NEW SOUTH WALES DEPARTMENT OF MINERAL RESOURCES

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: BASALT GRAVELS Age: RECENT Interpretation Code: Y101
Basal Information: Depth to Base: 21 Base Elevation: 577.0 Thickness: 21.0
Geologic Description: BASALT GRAVELS AND ALLUVIUM
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNNAMED Age: JURASSIC Interpretation Code: Y102
Basal Information: Depth to Base: 92.0 Base Elevation: 506.0 Thickness: 71.0
Geologic Description: ROOT PENETRATED CLAYSTONE, THIN SANDSTONE, THIN COAL
Reported Environment:
Interpreted Environment: LEVEE BACKSWAMP
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: AGE UNCERTAIN. POSSIBLY EQUIVALENT TO DRALLO FM.

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code: Y103
Basal Information: Depth to Base: 291.0 Base Elevation: 307.0 Thickness: 119.0
Geologic Description: QUARTZOSE SANDSTONE, MINOR SILTSTONE AND MUDSTONE.
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: MAJOR AQUIFER. SURAT BASIN SEQUENCE.

STRATIGRAPHY: DIGILAH FM Age: JURASSIC Interpretation Code: Y104
Basal Information: Depth to Base: 311 Base Elevation: 287 Thickness: 20
Geologic Description: MUDSTONE, ROOT PENETRATED AND MINOR SANDSTONE
Reported Environment:
Interpreted Environment: LEVEE, BACKSWAMP
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THIS FORMATION AND UNDERLYING UKEBUNG FM EQUIVALENT TO PURLAWAUGH FM. SURAT BASIN UNIT

STRATIGRAPHY: UKEBUNG FM Age: JURASSIC Interpretation Code: Y105
Basal Information: Depth to Base: 351.0 Base Elevation: 247.0 Thickness: 40.0
Geologic Description: PELLETOIDAL CLAYSTONE, MINOR SANDSTONE AND COAL
Reported Environment:
Interpreted Environment: LOWER DELTAIC
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: DIGILAH FM AND UKEBUNG FM EQUIVALENT TO PURLAWAUGH FM SURAT BASIN UNIT. STRATIGRAPHY UNCERTAIN

STRATIGRAPHY: WALLINGARAH FM Age: TRIASSIC Interpretation Code: Y106
Basal Information: Depth to Base: 384.4 Base Elevation: 214.0 Thickness: 33.7

Geologic Description: SILTSTONE, SILTSTONE-SANDSTONE LAMINITE AND SANDSTONE.
Reported Environment: SAYFILL TO TIDAL-INTERTIDAL MUDFLAT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO DIGBY FM

STRATIGRAPHY: WOLLAR SST Age: PERMO-TRIASSICInterpretation Code:Y107
Basal Information: Depth to Base:557.0 Base Elevation: 41.0 Thickness: 172.6
Geologic Description: SANDSTONE MINOR SILTSTONE, PEBBLY. POLYMICTIC CONGLOMERATE IN BASAL UNIT
Reported Environment: FANGLOMERATE AND FLUVIAL CONGLOMERATE AND SANSTONE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO DIGBY FM

STRATIGRAPHY: MIDDLE RIVER COAL MB Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:563.4 Base Elevation: 34.6 Thickness: 6.9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: THE GAP SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:568.8 Base Elevation: 29.2 Thickness: 5.4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: ANGUS PLACE SST Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:608.5 Base Elevation: -10.5 Thickness: 1 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: BAAL BONE FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:610.0 Base Elevation: -12.0 Thickness: 1.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:638.3 Base Elevation: -40.3 Thickness: 3.8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:642.8 Base Elevation: -44.8 Thickness: 4.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:678.1 Base Elevation: -80.1 Thickness: 35.3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:678.1 Base Elevation: -80.0 Thickness: 121.6
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MIDDLE RIVER MB, THE GAP SST, ANGUS PLACE SST, BAAL BONE FM, LITHGOW COAL, MARRANGAROO CGL, NILE SUB-GP

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:652.3 Base Elevation: -54.3 Thickness: 5.1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BERRY FM Age: PERMIAN Interpretation Code:Y117
Basal Information: Depth to Base:TD Base Elevation: -100* Thickness:)19.9
Geologic Description: SILTSTONE, MINOR SANDSTONE, SPORADIC BIOTURBATION AND ZOOPHYCOS BURROWS
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO WATERMARK FM. NOT FULLY PENETRATED.

CONTROL POINT: BRIGALOW DDH 2

REFERENCE # G9

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-12	30 57'07"S	149 38'33"E	430	430	-261.2	691.15	

REFERENCE: Y101

DATA SUPPLIED BY NSW DEPARTMENT OF MINERAL RESOURCES

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Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:69 Base Elevation: 361 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:89.65 Base Elevation: 340.35 Thickness: 20.65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PURLAWAUGH FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:134.55 Base Elevation: 295.45 Thickness: 44.90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:246 Base Elevation: 184 Thickness: 111.45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:426 Base Elevation: 4.0 Thickness: 180
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:455 Base Elevation: -25 Thickness: 29

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:541.6 Base Elevation: -111.6 Thickness: 7.15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES.

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:558 Base Elevation: -128 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, UNNAMED SM (2)	490.5	-60.5	8.73
	COAL, UNNAMED SM (3)	496.3	-66.3	5.44
	COAL, UNNAMED SM (4)	508.6	-78.6	2.48

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:596.5 Base Elevation: -166.5 Thickness: 38.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:636.8 Base Elevation: -206.8 Thickness: 40.3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:685.4 Base Elevation: -255.4 Thickness: 48.6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -261 * Thickness:)5.45
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:
Tectonic Structure:
Remarks

Feature	Depth	Elevation	Thickness

NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: BULGA DDH 1

REFERENCE # G11

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/55-16	31 10'30"S	149 38'37"E	400	400	-260.9	660.9	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:154.5 Base Elevation: +245.5 Thickness: 154.5
Geologic Description: INTERMEDIATE AND ALKALINE LAVA AND PYROCLASTICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:339 Base Elevation: +62 Thickness: 184
Geologic Description: SILTSTONE, SILTSTONE-SANDSTONE LAMINITES
Reported Environment: MARINE TO BRACKISH BAY SILTS,TIDAL AND INTERTIDAL MUDFLATS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:391 Base Elevation: +9 Thickness: 53
Geologic Description: LITHIC PEBBLE CONGLOMERATE AND MEDIUM TO COARSE QUARTZ SANDSTONE
Reported Environment: FLUVIAL CONGLOMERATE AND SANDSTONE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:481.5 Base Elevation: -81.5 Thickness: 90.5
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, UNNAMED SM (2)	452.6	-52.6	2.7
COAL, HOSKISSONS (4)	470.4	-70.4	3.7

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:530 Base Elevation: -130 Thickness: 48.5
Geologic Description:
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:579.5 Base Elevation: -179.5 Thickness: 49.5
Geologic Description: SILTY,FINE-MEDIUM GRAINED QUARTZ-LITHIC SANDSTONE WITH ABUNDANT DROPPED PEBBLES,AND ABUNDANT BIOTURBATION
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGABRI VOLCANICS Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -[illegible]1 * Thickness:)81.4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks *NOT PENETRATED TERMINAL DEPTH 660.9 METRES

CONTROL POINT: SYLONG DDH 1

REFERENCE # G38

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-1	32 32'00"S	150 01'10"E	521	522	395	127	

REFERENCE: HOLMES, C.G.
COULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:62 Base Elevation: 460 Thickness: 61
Geologic Description: INTBDD-LAMD SST SLTST MDST CLST AND COAL. BDG S'TIMES CHURNED XBDD MICRO-XBDD. CARB PART, PLANT FOSS, NUM ROOT REM IN AND BELOW SM 3. TFAC.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SM 1	29	493	1
COAL SM 2	44	478	2
COAL SM 3	50	472	3

Tectonic Structure:
Remarks

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:62 Base Elevation: 460 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WITTINGHAM CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:75 Base Elevation: 447 Thickness: 13
Geologic Description: INTBDD-LAMD SLTST MDST SST. CARB PARTINGS, LITHIC PBLS. MICRO-XBDG, CHURNED BDG. GRADATIONAL AND EROSIONAL BASES.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +395.# Thickness:)65
Geologic Description: TOP 13 M SEE MULBRING SLTST. BOTTOM 52 M CONSISTS OF GREEN-GREY TO PURPLE IGNEUOUS ROCK WITH ABUNDANT QUARTZ VEINS AND CAVITY FILL.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
IGNEOUS ROCK	TD	+395#	)52

Tectonic Structure:
Remarks CONTAINS MULBRING SLTST.

CONTROL POINT: BYLONG DDH 2

REFERENCE # G37

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-1	32 28'23"S	150 08'14"E	+377	+378	+306	72	

REFERENCE: HOLMES, C.G.
COULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:30 Base Elevation: 348 Thickness: 17
Geologic Description: LT-GY F-M AND YEL-RED BN M-C SST. BOTH QZ-LI, GEN MASS AND UNIFORM. SILTY AND IRON-RICH LAM(F-M SST), LI PBLS, IRON STAIN(M-C SST). PLANT FRAG.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: BASE OF WOLLOMBI CM. CORE BADLY BROKEN IN PLACES

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:30 Base Elevation: 348 Thickness: 29
Geologic Description: SST (TOP,BOTTOM), CLST AND MDST (MIDDLE). CLST-MDST IS LAMD IRON-RICH TFAC. SST IS C-VC IRON STAINED PBLY OR F-M WITH INTLAM SLTST, MICRO-XBDG.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS WATTS SST IN BASAL 17 M. REFER TO FOR MORE DETAILED GEOLOGIC DESCRIPTION. CORE BADLY BROKEN IN PLACES

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:41 Base Elevation: 337 Thickness: 11
Geologic Description: INTBDD-LAMD MDST AND CLST WITH MINOR F SST AND COAL. IRON STAINING AND LAM, SOME IRREG AND DISTURBED BDG CARB AND TFAC.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: TOP OF WITTINGHAM CM. CORE BADLY BROKEN IN PLACES.

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +306 ± Thickness:)42
Geologic Description: INTBDD-LAMD MDST CLST LAMINITE AND SST; COARSER LITHOLOGIES TOWARD BASE.IRON STAINS AND LAM, CARB-COALY PART, SOME IRREG AND DISTURBED BDG
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS DENMAN FM AT TOP. SOME CLST IS MASSIVE WITH CONCHOIDAL FRACTURE. CORE BADLY BROKEN IN PLACES.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +306 ± Thickness:)71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS WOLLOMBI AND WITTINGHAM CM

CONTROL POINT: BYLONG DDH 3

REFERENCE # 636

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 21'37"S	150 06'10"E	+235	+236	+59	177	

REFERENCE: HOLMES, G.G.
GOULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:115 Base Elevation: 121 Thickness: 114
Geologic Description: INTBDD-LAMD SST SLTST MDST CLST AND COAL. CARB, VAR. IRON CONTENT. BDG IS LAMD,IRREG,DISTURBED; MICRG AND LOW ANGLE XBDS. PLANTS,ROOTS,MUDCRACKS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 7	89	147	1
COAL, SM 8	95	140	6
COAL, RAYSWATER SM	104	132	3
COAL, SM 10	110	126	1

Tectonic Structure:
Remarks: COAL (10 SMS) IS BETTER QUALITY TOWARD BOTTOM

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:115 Base Elevation: 121 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS WITTINGHAM CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +59 # Thickness:)62
Geologic Description: INTBDD-LAMD MDST SILTS AND LESSER CLST AND F-VF SST. DESSICATION CRACKS, BIOTURB, CARB PART, PLANT REMAINS, SOME MICRO-XBD. CALC SID PY TFAC
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
GLENDONITE STRUCTURE	171.92	64.08	
GLENDONITE STRUCTURE	172.90	63.1	

Tectonic Structure:
Remarks:

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +59 # Thickness:)62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS MULBRING SILTSTONE

CONTROL POINT: COOGAL DDH 1

REFERENCE # G8

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/55-12	30°57'30"S	149°52'25"E	270	270	-200.3	470.3	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:47 Base Elevation: 224 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:74.5 Base Elevation: +195.5 Thickness: 27.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PURLAWAUGH FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:92.5 Base Elevation: 177.5 Thickness: 18.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:282 Base Elevation: -12 Thickness: 189.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:311.5 Base Elevation: -41.5 Thickness: 29.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:454 Base Elevation: -184 Thickness: 142.5

Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, HOSKISSONS (5)	421.4	-151.4	6.0
	COAL, MELVILLES (6)	447.7	-177.7	1.1

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -200 ± Thickness: >16.25
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: CURLEWIS DDH 1

REFERENCE # G16

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-13	31 10'45"S	150 21'03"E	278	278	+37.12	240.88	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:82.0 Base Elevation: 194 Thickness: 82.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:137 Base Elevation: 141 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:199 Base Elevation: +78 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:219 Base Elevation: 59 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: 37.12# Thickness:)21.88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: CURRYALL DDH 1

REFERENCE # G33

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SI/55-4	32 09'00"S	149 50'00"E	420	420	59	361	

REFERENCE: Y1

DATA SUPPLIED BY THE NEW SOUTH WALES DEPARTMENT OF MINERAL RESOURCES

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:3.2 Base Elevation: 416.8 Thickness: 3.2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: PERMO-TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:168.6 Base Elevation: 251.2 Thickness: 165.6
Geologic Description: CONGLOMERATE, SANDSTONE, MINOR CLAYSTONE
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO DIGBY FM

STRATIGRAPHY: MIDDLE RIVER COAL MB Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:178.3 Base Elevation: 241.7 Thickness: 9.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: THE GAP SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:188.6 Base Elevation: 231.4 Thickness: 10.3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: MOOLARBEN COAL MB Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:211.3 Base Elevation: 208.7 Thickness: 4.1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:269.8 Base Elevation: 150.2 Thickness: REMARK

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM. THICKNESS GIVEN AS 186.2M WHICH IS GREATER THAN THAT OF ILLAWARRA CM

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:312.3 Base Elevation: 107.7 Thickness: 35.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:312.3 Base Elevation: 107.7 Thickness: 143.5
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BLACK JACK CM. CONTAINS MIDDLE RIVER MB, THE GAP SST, MOOLARBEN MB, LITHGOW COAL, NILE SUB-GP

STRATIGRAPHY: BERRY FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:353.0 Base Elevation: 67.0 Thickness: 40.7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO WATERMARK FM. BASE OF BASIN IN ALTERED ACID VOLCS. AT 353.01 M.

STRATIGRAPHY: BASEMENT Age: Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: 59% Thickness:)7
Geologic Description: ALTERED ACID VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DENISON DDH 1

REFERENCE # G4

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-12	30 51'01"S	149 53'13"E	262	262	-150.1	412.10	

REFERENCE: DATA SUPPLIED BY NSW DEPARTMENT OF MINERAL RESOURCES

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code: Y101
Basal Information: Depth to Base: 65 Base Elevation: 197 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DICBY FM Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base: 73 Base Elevation: 189 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: 169.6 Base Elevation: 92.4 Thickness: 9.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code: Y104
Basal Information: Depth to Base: 230 Base Elevation: 32 Thickness: 157
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HOSKISSONS (7)	147.7	114.3	7.42
COAL, UNNAMED SM (1)	78.15	189.85	3.86
COAL, UNNAMED SM (6)	111.6	150.4	1.80

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code: Y105
Basal Information: Depth to Base: 293.5 Base Elevation: -31.5 Thickness: 63.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y136
Basal Information: Depth to Base:336.5 Base Elevation: -74.5 Thickness: 43.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:400 Base Elevation: -138 Thickness: 63.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -156 * Thickness:)12.1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: DENMAN DDH 1

REFERENCE # G48

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH, CORED	SI/56-1	32 16'05"S	150 43'43"E		185	-81	266	

REFERENCE: STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT MINES DURING 1968-1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 Page Pubin Year: 1972

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:48 Base Elevation: 137 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, SEAM 1	27.90	157.10	3.58

Tectonic Structure:
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:TD Base Elevation: -81* Thickness:)825
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, 8 SEAMS	T'OUT		
	IGNEOUS ROCK	85.92	99.08	2.88

Tectonic Structure:
Remarks

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y130
Basal Information: Depth to Base:TD Base Elevation: -81* Thickness:)266
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks WOLLOMBI AND WITTINGHAM CM

CONTROL POINT: DIGBY DDH 1

REFERENCE # G14

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/56-13	31 10'08"S	150 13'15"E	+380	+388	-173.4	+553.4	

REFERENCE: Y101 WEBER, C.P., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:41 Base Elevation: +339 Thickness: 41
Geologic Description: POLYMICTIC CONGLOMERATE
Reported Environment: TERRESTRIAL AND FLUVIAL CONGLOMERATE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:195 Base Elevation: +185 Thickness: 12
Geologic Description: BIOTURBATED SILTY QUARTZ-LITHIC SANDSTONE
Reported Environment: TOP OF MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES. CORRELATES WITH BULGA FM-ARCHERFIELD SST

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:252 Base Elevation: +128 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL,WONDOBAH SM(10)	150	+250	8.26
COAL, UNNAMED SM (5)	109	+291	3.51
COAL, UNNAMED SM (6)	113	+287	3.50
COAL, UNNAMED SM(13)	235	+165	3.36

Tectonic Structure:
Remarks HOSKISSONS SEAM INTRUDED BASE AT 181 EQUALS WOLLOMBI AND WITTINGHAM COAL MEASURES

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:414 Base Elevation: -34 Thickness: 219
Geologic Description: GREY TO DARK GREY SILTSTONE
Reported Environment: PRO-DELTA MUD AND SILT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CORRELATES WITH MULBRING SILTSTONE

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:500 Base Elevation: -120 Thickness: 86
Geologic Description: SANDY BIOTURBATED SILTSTONES WITH COMMON TO ABUNDANT DROPPED PEBBLES
Reported Environment: DEPOSITED IN A FAN DELTA ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CORRELATES WITH THE BRANXTON FORMATION

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:516 Base Elevation: -136 Thickness: 16
Geologic Description:
Reported Environment: LOWER DELTA PLAIN TO TIDAL FLAT COALS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, UNNAMED SM(15) 516 -116 7.1
Tectonic Structure:
Remarks CRETA COAL MEASURE EQUIVALENTS MAULES CREEK COAL MEASURE EQUIVALENT

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:521 Base Elevation: -141 Thickness: 5
Geologic Description: PELLET CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:522 Base Elevation: -142 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT

CONTROL POINT: DLONA DDH 1

REFERENCE # G21

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH + WIRELINE LOGS	CH/56-13	31 23'40"S	150 23'15"E	+358	+358	-381	739	

REFERENCE: Y101

DATA SUPPLIED BY NSW DEPT MIN. RES.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:169 Base Elevation: +189 Thickness: 169 *
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE,POORLY TO MODERATELY WELL SORTED,WELL ROUNDED
Reported Environment: DEBRIS FLOW,ALLUVIAL FAN AND STREAM DEPOSITED CONGLOMERATES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: 15 METRE COALY INTERVAL WITH BASE AT 125 METRES *NOT TOTAL THICKNESS PRECOLLARED IN OUTCROP

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:408 Base Elevation: -50 Thickness: 6.0
Geologic Description: BIOTURBATED SILTY SANDSTONE
Reported Environment: LAST UNIT OF MARINE TRANSGRESSION ?BEACH ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: WITHIN BLACK JACK CM. CORRELATES WITH ARCHERFIELD SST/BULGA FM

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:450 Base Elevation: -92 Thickness: 281
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, WONDOBAH SM(5)	292	+66	1.31
COAL, UNNAMED SM (6)	325.5	+32.5	3.65
COAL, HOSKISSONS (9)	402	-44	15

Tectonic Structure:
Remarks: EQUALS WOLLOMBI AND WITTINGHAM COAL MEASURES

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:631 Base Elevation: -273 Thickness: 223
Geologic Description: MARINE SILTSTONE
Reported Environment: PRO-DELTA SILTS AND DELTA FRONT LAMINITES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CORRELATES WITH MULBRING SILTSTONE

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:732 Base Elevation: -374 Thickness: 101
Geologic Description: BIOTURBATED SILTY SANDSTONE WITH COMMON TO ABUNDANT DROPPED PEBBLES
Reported Environment: FAN DELTA ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CORRELATES WITH BRANXTON FORMATION

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code: Y106
Basal Information: Depth to Base: 739 Base Elevation: -391 Thickness: NP #
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
Tectonic Structure:				
Remarks	NOT PENETRATED			

CONTROL POINT: DOYLES CREEK DDH 10

REFERENCE # G47

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH, CORED	SI/56-1	32 16'21"S	150 38'08"E		141	-758	899	

REFERENCE: Y101 STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT MINES DURING 1968-1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:96 Base Elevation: 45 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:325 Base Elevation: -184 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y125
Basal Information: Depth to Base:325 Base Elevation: -184 Thickness: 229
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 7 SEAMS T'OUT
Tectonic Structure:
Remarks CONTAINS WATTS SST AT BASE

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y130
Basal Information: Depth to Base:347 Base Elevation: -206 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y135
Basal Information: Depth to Base:834 Base Elevation: -693 Thickness: 509
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 21 SEAMS T'OUT
COAL, BAYSWATER SM 733.36 -592 9.36
Tectonic Structure:
Remarks DENMAN FM AT TOP

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y140
Basal Information: Depth to Base:834 Base Elevation: -693 Thickness: 738
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WOLLOMBI AND WITTINGHAM CM

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y150
Basal Information: Depth to Base:TD Base Elevation: -758* Thickness:)65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DOYLES CREEK DDH 1.4

REFERENCE # G49

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH, CORED	SI/56-1	32 42'30"S	150 43'33"E		304	-330	634	

REFERENCE: Y1 STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT MINES DURING 1968-1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:37 Base Elevation: 267 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:322 Base Elevation: -18 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:322 Base Elevation: -18 Thickness: 285
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 12 SEAMS T'OUT
TUFF (SEVERAL BEDS)
INTRUSIVE (SEVERAL)
Tectonic Structure:
Remarks WATTS SST AT BASE. COAL ANALYSIS AVAILABLE

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:335 Base Elevation: -31 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y125
Basal Information: Depth to Base:TD Base Elevation: -330* Thickness:)312
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 5 SEAMS T'OUT
TUFF

INTRUSIVES
IGNEOUS ROCK TD -330* 6
Tectonic Structure:
Remarks DENMAN FM AT TOP. COAL ANALYSIS AVAILABLE

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y130
Basal Information: Depth to Base:TD Base Elevation: -330* Thickness: >597
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WOLLOMBI AND WITTINGHAM CM

CONTROL POINT: DUNEDOO

REFERENCE # G35	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
		SECTION	SI/55-4	32 01'46"S	149 19'13"E	+380	+380	+380		

REFERENCE: X1 LOUGHNAN, F.C., & EVANS, P.R.
THE PERMIAN AND MESOZOIC OF THE MERRIWA-BINNAWAY-BALLIMORE AREA, NEW SOUTH WALES
JOURNAL AND PROCEEDINGS OF THE ROYAL SOCIETY OF NEW SOUTH WALES, 111 Page 107-119 Publn Year: 1978

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DUNEDOO FM Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: Base Elevation: +380 Thickness: 30-50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO BLACK JACK FM & ILLAWARRA CM. UNCONFORMABLY OVERLIES TUCKLAN BEDS, UNDERLIES BALLIMORE FM

CONTROL POINT: FERRIER DDH 2

REFERENCE # 618

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-13	31 14'59"S	150 28'00"E	290	290	-266.7	556.69	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:111 Base Elevation: 179 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:337 Base Elevation: -47 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:499 Base Elevation: -209 Thickness: 162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:547 Base Elevation: -257 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, UNNAMED SM (1)	506.8	-216.8	1.88
COAL, UNNAMED SM (3)	521.4	-231.4	2.43
COAL, UNNAMED SM (4)	531.9	-241.9	1.67

Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:555 Base Elevation: -265 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code: Y106
Basal Information: Depth to Base: TD Base Elevation: -267 ft Thickness: >1,69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: GORAN DDH 1

REFERENCE # G13

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-13	31 10'55"S	150 07'56"E	+370	+378	-294.7	664.7	

REFERENCE: Y101

DATA SUPPLIED BY NSW DEPT MIN. RES.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:143 Base Elevation: -227 Thickness: 143
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE
Reported Environment: ALLUVIAL FAN AND STREAM DEPOSITED CONGLOMERATES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # INCLUDES 60M INTRUSION WITH BASE AT 246M. STONEY COAL INTERVAL (0.6M THICK), BASE AT 138M.

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:356 Base Elevation: +4 Thickness: 6.5
Geologic Description: BIOTURBATED AND BURROWED SILTY SANDSTONE
Reported Environment: TOP OF MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK CM. CORRELATES WITH ARCHERFIELD SST/BULGA FM

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:434 Base Elevation: -64 Thickness: 291 #
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, WONDOBAH SM(7)	323	+47	10
COAL, HOSKISSONS (9)	347	+23	6.7

Tectonic Structure:
Remarks INCLUDES EQUIVALENTS OF WOLLOMBI AND WITTINGHAM COAL MEASURES #INCLUDES 48 METRE INTRUSION WITH BASE AT 251 M.

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:593 Base Elevation: -223 Thickness: 159
Geologic Description: MARINE SILTSTONE,CLAYSTONE AND SANDSILT LAMINITE
Reported Environment: PRO-DELTA SILTS AND DELTA FRONT LAMINITES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CORRELATES WITH MULBRING SILTSTONE

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:# Base Elevation: Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks #NOT PENETRATED ,ENTERED QUARTZ DIORITE ?STILL AT 520 M T.DEPTH 664.7

CONTROL POINT: GOULBURN VALLEY DDH1

REFERENCE # G46

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 23'27"S	150 31'19"E	148	149	-412	561	

REFERENCE: HOLMES, G.G.
GOULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:144 Base Elevation: 5 Thickness: 27
Geologic Description: F-C SANDSTONE. MASSIVE OR COALY AND SLTST LAM. SIDERITE BANDS, CARB PARTINGS, PLANT FRAGMENTS, WORM BURROWS IN SILTSTONE LAM.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:144 Base Elevation: 5 Thickness: 143
Geologic Description: INTBDD-LAMD F-M SST SLTST CLST COAL WITH LESS MDST AND M-C SST. FLAGGY, XBDD, MICRO-XBDD, LAMINITES. CARB PART, PLANT FOSS, ROOT REMAINS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 2	23	126	3
COAL, SM 3	39	110	3
COAL, SM 4	70	79	10
COAL, SM 5	89	60	6

Tectonic Structure:
Remarks CONTAINS WATTS SST AT BASE. COAL SM 13-16 M DEPTH

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:186 Base Elevation: -37 Thickness: 42
Geologic Description: INTBDD-LAMD VF-M SST SLTST AND MDST, OFTEN FORMING LAMINITE. BIOTURB, IRREG LAMD, MICRO-XBDG. PLANT REMAINS, COALY PARTING, SID NOD AND ZONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM.

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:559 Base Elevation: -410 Thickness: 415
Geologic Description: INTBDD-LAMD VF-M SST SLTST MDST CLST COAL, MINOR M-VC SST AND IG ROCK. IRREG LAM, BIOTURB, MICRO-XBDS, BXDS, CARB-COALY PART, PLANT & ROOT REM.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	T'OUT		<8
IGNEOUS ROCK	268	-119	1
COAL, IGNEOUS ROCK	452	-303	7.88
COAL, BAYSWATER SM	490	-341	1.33

Tectonic Structure:
Remarks SID NOD AND ZONES PRESENT. 22 COAL SMS. BUFF COLOURED IGNEOUS ROCKS ASSOCIATED WITH COAL SMS 11, 14, 17, 21.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:559 Base Elevation: -410 Thickness: 558
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -412 * Thickness:)2
Geologic Description: BROWNISH-GREY SLTST WITH F-VF SST. LAMINATED, MICRO-XBDD, BIDTURB. CALCITE WITH CONE-IN-CONE STRUCTURE. PLANT FOSS ON BEDDING PLANES. SIDERITIC
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -412 * Thickness:)2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE

CONTROL POINT: GOULBURN VALLEY DDH2

REFERENCE # G42

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 25'12"S	150 19'50"E	+205	+206	-256	462	

REFERENCE: HOLMES, G.G.
GOULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Yi71
Basal Information: Depth to Base:29 Base Elevation: 177 Thickness: 28
Geologic Description: M-C PEBBLY SST AND CGL, AND INTBDD FLAGGY CLST, SLTST, AND F SST. IRON STAINED AND IRON RICH BANDS. MANGANESE DENDRITES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Yi02
Basal Information: Depth to Base:165 Base Elevation: 41 Thickness: 23
Geologic Description: INTBDD-LAMD F-C SST AND SLTST. MICRO AND PLANAR X-BDG, GRADED BDG, SAND FILLED DESICATION CRACKS, CARB-COALY LAM, PLANT AND ROOT REM, SID, HARD.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Yi03
Basal Information: Depth to Base:165 Base Elevation: 41 Thickness: 136
Geologic Description: INTBDD-LAMD CLST COAL SST SLTST, SST VF-M, S'TIMES COARSE. GEN ARGIL. MICRO-XBDG, BIOTURB, BURROWS, DESSICATION CRACKS, ROOT AND PLANT REM, CARB
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	49	157	1
COAL	78	128	1.5
COAL	82	124	1.8
COAL	93	113	2.7

Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks BDG INCLINED (10 DG, S'TIMES TO 60 DG(ND THICKNESS CORRECTION). SEQUENCE CONTAINS SIDERITE IN ZONES OR REPLACING WOOD.

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Yi04
Basal Information: Depth to Base:198 Base Elevation: 8 Thickness: 33
Geologic Description: INTBDD-LAMD SLTST AND F SST. LOW ANGLE PLANAR XBDS, DESSICATION CRACKS, BURROWS, SID INTERVALS, SLUMPED AND DISTORTED BDG. SOME BRECCIATION
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Yi05
Basal Information: Depth to Base:442 Base Elevation: -236 Thickness: 277
Geologic Description: INTBDD-LAMD SST SLTST CLST AND COAL. CARB, SID ZONES-NOD, MICRO AND LOW ANGLE PLANAR XBDS, BIOTURB, SLUMPS, DESSICATION CRACKS, PLANT & ROOT REM
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	253	-47	1.43

	COAL	296	-90	1.85
	COAL, 3 SHS	351	-145	7.8
	COAL	391	-185	3.7

Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks: PARTIAL-COMPLETE FINING UP CYCLES OF SST(EROSIVE BASE) SLTST CLST AND COAL. TOP IS DENMAN FM.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:442 Base Elevation: -236 Thickness: 413
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks: CONTAINS WOLLOMBI AND WITTINGHAM CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -255 + Thickness: >21
Geologic Description: SILTSTONE WITH CLST LST AND SID BANDS, SST LAM. BIOTURB, SLUMPS, PLANAR-IRREG BDG. PY NOD LENSES AND VEINS. CONE-IN-CONE IN LST.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks:

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -256 + Thickness: >21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: SMALL FAULTS, SLICKENSIDES, DIPPING BDS.
Remarks: CONTAINS MULBRING SLTST.

CONTROL POINT: GROWEE GULPH DDH 1

REFERENCE # G39

Organisation	Type	Hapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 41'41"S	150 06'06"E	+704	+705	+532	173	

REFERENCE: HOLMES, G.G.
COULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001 (MICROFICHE) Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: NARRABEEN GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:47 Base Elevation: +658 Thickness: 46
Geologic Description: C-VC SANDSTONE AND CONGLOMERATE, MINOR M SST. BUFF TO YEL-BN, UZOSE TO QZ-LI, ITON RICH BNDS AND CONCRETIONS, SOME LOW ANGLE XBDS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS NEWCASTLE CM.

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:124 Base Elevation: +581 Thickness: 77
Geologic Description: INTBDD-LAND VF-M SST AND SLTST, COAL, LESSER CLST. ARGIL TFAC CARB.- LOW ANGLE XBDS, BURROWS, BIOTURB, PLANT AND ROOT REM, DESSICATION CRACKS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	63	642	15.67
COAL	75.15	630	0.71
COAL	82.20	623	1.31
COAL	88.28	617	3.07

Tectonic Structure: SOME MICROFAULTS
Remarks

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:133 Base Elevation: +572 Thickness: 10
Geologic Description: LAMINITE OF DK-GY MUDSTONE AND VF LT-GY SANDSTONE. BDG SLIGHTLY BIOTURB, PARTICULARLY IN UPPER HALF. IRON RICH BANDS, SID CONCRETIONS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM.

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +532 * Thickness: >49
Geologic Description: INTBDD-LAND SST SLTST MDST CLST AND COAL, MAFIC IGNEOUS ROCKS; FINER SED MOSTLE AT TOP. V ARGIL, CARB, TFAC, MICRO-XBDDID CONCRETIONS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	134.58	571	1.12
COAL	147.03	558.97	1.26
IGNEOUS ROCK	154	550	1.90
IGNEOUS ROCK	TD	532	>17.89

Tectonic Structure:
Remarks DENMAN FM AT TOP

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +532 * Thickness: >126
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features:
Tectonic Structure:
Remarks

Feature	Depth	Elevation	Thickness

CONTAINS WOLLOMBI AND WITTINGHAM CM.

CONTROL POINT: GUNNADILLY DDH 1

REFERENCE # G19

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-13	31 29'02"S	150 31'00"E	325	325	-467.6	792.6	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:12 Base Elevation: +313 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:236 Base Elevation: +89 Thickness: 224
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE AND MINOR CROSSBEDDED SANDSTONE
Reported Environment: STREAM DEPOSITED CONGLOMERATE AND CHANNEL SANDSTONE
Interpreted Environment:FLUVIAL CONGLOMERATE
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:636.9 Base Elevation: -311.9 Thickness: 4.7
Geologic Description: BIOTURBATED AND BURROWED SILTY SANDSTONE
Reported Environment: TOP OF MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK FORMATION

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:731 Base Elevation: -406 Thickness: 495
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, UNNAMED SM (2)	345.4	-20.6	5.4
COAL, UNNAMED SM(10)	516.1	-191.1	3.5
COAL, UNNAMED SM(11)	520.5	-195.5	
COAL, HOSKISSONS SM	626.6	-301.6	17.5

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:* Base Elevation: Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

* NOT PENETRATED

CONTROL POINT: MT MARLOWE INLIER

REFERENCE # C30

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION	SH/55-16	31 52'43"S	149 21'18"E	+450 ?	+450 ?	+450 ?		

REFERENCE: X1 HIGGINS, M.L., & LOUGHNAN, F.C.
FLINT CLAYS OF THE MERRYCOEN-DIGILAH AREA
PROCEEDINGS OF THE AUSTRALASIAN INSTITUTE OF MINING AND METALLURGY, 246 Page 33-40 Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DUNEDOO FM Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: Base Elevation: +450 Thickness: 12
Geologic Description: CGLS, PORCELLANITES, SSTS, & SANDY SHALES WITH THIN LENTICULAR BEDS FLINT CLAY, CARB SH, IMPURE COAL. GLOSSOPTERIS IMPR IN SOME PORC. & FL. CLAY
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO BLACK JACK FM, ILLAWARRA CM. UNCONFM OVERLIES SIL-DEV TUCKLAN BEDS, UNDERLIES TRIASSIC BOULDERWOOD CGL. 0-15 M

CONTROL POINT: MURRURUNDI 1

REFERENCE # G54

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
WANCOL	WELL	SH/56-13	31 47'30"S	151 53'20"E		+462	+157	305	

REFERENCE: THIS REPORT

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:X10i

Basal Information: Depth to Base:TD Base Elevation: +157 # Thickness: >305

Geologic Description: THICK SEQUENCE OF CONGLOMERATE, SOME COAL NEAR TOP, SILL IN MIDDLE OF COAL

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

CONTROL POINT: NANDOURA DDH 1

REFERENCE # G32

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SI/55-4	32 02'45"S	149 46'55"E	456.0	456.3	144.8	311.2	

REFERENCE: Y1

DATA SUPPLIED BY THE NEW SOUTH WALES DEPARTMENT OF MINERAL RESOURCES

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: BASALT GRAVELS Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:23.0 Base Elevation: 433 Thickness: 23.0
Geologic Description: BASALT GRAVELS AND IRON-STAINED DISAGGREGATED SANDSTONE.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: PERMO-TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:180.3 Base Elevation: 275.7 Thickness: 166.7
Geologic Description: CONGLOMERATE, SANDSTONE, MINOR CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
DIGBY CGL FACIES 180.3 275.7 109.7
Tectonic Structure:
Remarks NARRABEEN GP EQUIVALENT TO DIGBY FM.

STRATIGRAPHY: MIDDLE RIVER COAL MB Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:186.3 Base Elevation: 269.7 Thickness: 5.9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: THE GAP SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:191.0 Base Elevation: 265.0 Thickness: 4.7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: MOOLARBEN COAL MB Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:224.0 Base Elevation: 232.0 Thickness: 3 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ANGUS PL-BAAL BONE Age: PERMIAN Interpretation Code:Y106

Basal Information: Depth to Base:227.0 Base Elevation: 229.0 Thickness: 3.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:227.7 Base Elevation: 179.0 Thickness: 3.6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:282.3 Base Elevation: 173.7 Thickness: 4.6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: 144.8 Thickness: >28.9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: 144.8* Thickness: >130.9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BLACK JACK FM, MIDDLE RIVER MB, THE GAP SST, MODLARREN COA PLACE-BAAL BONE FMS, LITHGOW COAL

CONTROL POINT: NAPIER DDH 1

REFERENCE # 628

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-16	31 36'40"S	149 45'26"E	560	560	-140.3	700.2	

REFERENCE: Y101

DATA SUPPLIED BY NSW DEPARTMENT OF MINERAL RESOURCES

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:42 Base Elevation: 518 Thickness: 42
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:98 Base Elevation: 462 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PURLAWAUGH FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:157 Base Elevation: 403 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:219 Base Elevation: 341 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:350.5 Base Elevation: 209.5 Thickness: 131.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:475 Base Elevation: 85 Thickness: 124.5

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:603.25 Base Elevation: -43.25 Thickness: 4.15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES.

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:616 Base Elevation: -56 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, UNNAMED SM (2)	478.23	81.77	3.13
	COAL, UNNAMED SM(14)	589.2	-29.2	3.45
	COAL, HOSKINSONS(15)	596.74	-36.74	7.01

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:660 Base Elevation: -100 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:685.4 Base Elevation: -125.4 Thickness: 25.4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -140 # Thickness:)14.9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: PARKVILLE 1

REFERENCE # G52

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Doth	status code
WANCOL	WELL	SH/56-13	31 56'00"S	150 49'00"E		+317	-140	457	

REFERENCE: THIS REPORT

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code: X101

Basal Information: Depth to Base: TD Base Elevation: -140 m Thickness: >457

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks: MANY SILLS

CONTROL POINT: POGGY 1

REFERENCE # G34

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
A.J. WOOD	WELL	SI/56-1	32 16'15"S	150 87'42"E	350	351			

REFERENCE:

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: Age: Interpretation Code:

Basal Information: Depth to Base: Base Elevation: Thickness:

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks

CONTROL POINT: QUEENSBOROUGH DDH 1

REFERENCE # 029

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/55-16	31 45'28"S	149 41'45"E	652.0	652.0	149.3	502.7	

REFERENCE: DATA SUPPLIED BY THE NEW SOUTH WALES DEPARTMENT OF MINERAL RESOURCES

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:9.0 Base Elevation: 643.0 Thickness: 9.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:65.7 Base Elevation: 586.3 Thickness: 56.0
Geologic Description: PEBBLY QUARTZOSE SANDSTONE AND CONGLOMERATE
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: MAJOR AQUIFER. SURAT BASIN UNIT.

STRATIGRAPHY: PURLAWAUGH FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:133.8 Base Elevation: 518.2 Thickness: 68.1
Geologic Description: LITHIC SANDSTONE SILTSTONE CLAYSTONE MINOR CONGLOMERATE AND OIL SHALE
Reported Environment:
Interpreted Environment: LOWER DELTAIC TO LAGOONAL
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: PROBABLY CORRELATES WITH WALLOON CM. SURAT BASIN UNIT

STRATIGRAPHY: WALLINGARAH FM Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:263.2 Base Elevation: 388.8 Thickness: 129.4
Geologic Description: QUARTZOSE SANDSTONE LAMINATED WITH SILTSTONES, CLAYSTONES. VERY BIOTURB.
Reported Environment: BAY TO INTERTIDAL MUDFLATS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MASSIVE BIOTURBATION	169.7	482.3	2.3

Tectonic Structure:
Remarks: EQUIVALENT TO NAPPERBY FM

STRATIGRAPHY: NARRABEEN GP Age: PERMO-TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:387.2 Base Elevation: 264.8 Thickness: 124.0
Geologic Description: SANDSTONE, POLYMICTIC PEBBLY CONGLOMERATE, MINOR PELLETOIDAL CLAYSTONE
Reported Environment: FANGLOMERATES AND FLUVIAL CONGLOMERATES OVERLAIN BY FLUVIAL SANDSTONE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
DIGBY CGL FACIES	387.2	264.8	24.4

Tectonic Structure:
Remarks

STRATIGRAPHY: MIDDLE RIVER COAL MB Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:403.3 Base Elevation: 249.0 Thickness: 12.7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: BAAL BONE FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:427.6 Base Elevation: 224.4 Thickness: 1.8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:468.4 Base Elevation: 183.6 Thickness: 2.7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:473.5 Base Elevation: 178.5 Thickness: 5.1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:478.0 Base Elevation: 174.0 Thickness: 4.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN ILLAWARRA CM.

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:478.0 Base Elevation: 174.0 Thickness: 90.8
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BLACK JACK FM. CONTAINS MIDDLE RIVER MB, BAAL BONE FM, LITL, MARRANGAROO CGL, NILE SUB-GP

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:483.5 Base Elevation: 168.5 Thickness: 5.45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks STRATIGRAPHY UNCERTAIN

STRATIGRAPHY: BERRY FM Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: 149.3ft Thickness:)19.2
Geologic Description: SILTSTONE, CLAYSTONE, MINOR SANDSTONE
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INTERSECTED BUT NOT FULLY PENETRATED. EQUIVALENT TO WATERMARK FM.

CONTROL POINT: SALTWATER DDH 1

REFERENCE # G27

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-16	31 30'15"S	149 45'45"E	460	460	-137	597	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: PURLAWAUGH FM Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:143 Base Elevation: +317 Thickness: 143
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:591 Base Elevation: -131 Thickness: 448
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:597 Base Elevation: -137 Thickness: 6.0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SPRINGFIELD DDH 1

REFERENCE # G22

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/56-13	31 23'50"S	150 15'12"E	320	320	-538.1	858.1	

REFERENCE: Y191 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:14.5 Base Elevation: +305.5 Thickness: 14.5
Geologic Description: SAND
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:121 Base Elevation: +199 Thickness: 106.5
Geologic Description: INTERMEDIATE AND ALKALINE LAVAS AND BRECCIAS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:232.5 Base Elevation: +87.5 Thickness: 111.5
Geologic Description: SILTSTONE, SILTSTONE-SANDSTONE LAMINITE AND FINE GRAINED SANDSTONE
Reported Environment: MARINE TO BRACKISH BAY SILTS AND INTERTIDAL MUDFLATS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:371 Base Elevation: -51 Thickness: 138.5
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE PLUS MINOR SANDSTONE
Reported Environment: ALLUVIAL AND FLUVIAL CONGLOMERATES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:561.1 Base Elevation: -241.1 Thickness: 6.3
Geologic Description: BIOTURBATED AND BURROWED SILTY SANDSTONE AND SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK FORMATION CORRELATES WITH ARCHERFIELD SANDSTONE-BULGA FM.

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:622.5 Base Elevation: -302.5 Thickness: 451.5

Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, UNNAMED SM (6)	428.7	-198.7	3.9
	COAL, UNNAMED SM(16)	487.6	-167.6	2.6
	COAL, UNNAMED SM(14)	554.6	-234.6	3.2
	COAL, HOSKISSONS(15)	569	-249.(	9.8

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:731 Base Elevation: -411 Thickness: 108.5
Geologic Description: SILTSTONE AND SILTSTONE-SANDSTONE LAMINITES
Reported Environment: PRODELTA SILTS AND DELTA FRONT LAMINITE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:854 Base Elevation: -534 Thickness: 123
Geologic Description: SILTY SANDSTONE WITH ABUNDANT DROPPED PEBBLES
Reported Environment: MARINE
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGABRI VOLCANICS Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -538 * Thickness: >4.1
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks *NOT PENETRATED TERMINAL DPTH 858.1 METRES

CONTROL POINT: STRATHEARN DDH 1

REFERENCE # G51

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SI/56-1	32 09'44"S	150 50'54"E		175	-327	502	

REFERENCE: Y1 ROGIS, J.
WEST MUSWELLBROOK COAL DRILLING PROGRAM-BASIC DATA REPORT
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1978/279 Page Publn Year: 1978

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: BURNHAMWOOD FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:258 Base Elevation: -83 Thickness: 258
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 21 SAMPLED SMS	T'OUT		
TUFF & COAL SMS 1-9	50	125	)38
COAL SEAMS 10-11	126	49	10
COAL, SEAM 21	258	-83	17.41

Tectonic Structure:
Remarks

STRATIGRAPHY: JERRYS PLAINS SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:258 Base Elevation: -83 Thickness: 258
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS BURNHAMWOOD FM

STRATIGRAPHY: FOYBROOK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -327# Thickness:)244
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 13 SAMPLED SMS	T'OUT		
COAL, EDINGLASSIE SM	442.62	-267.2	3.66

Tectonic Structure:
Remarks

STRATIGRAPHY: VANE SUB-GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -327# Thickness:)244
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -327 Thickness:)502
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BURNHAMWOOD AND FOYERGOK FORMATIONS

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:TD Base Elevation: -327 Thickness: >502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITTINGHAM CM.

CONTROL POINT: TEXAS DDH 1

REFERENCE # G17

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-13	31 10'25"S	150 28'49"E	284	284	-36	320.00	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:36 Base Elevation: 248 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:54 Base Elevation: 230 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:185 Base Elevation: +99 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:285 Base Elevation: -1 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:291 Base Elevation: -7 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WERRIE BASALT Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -36 * Thickness: 329

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:
Tectonic Structure:
Remarks

Feature	Depth	Elevation	Thickness

NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: TRINKEY DDH 1

REFERENCE # G23	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	NSW DEPT MIN RES	DDH	SH/56-13	31 23'20"S	150 00'02"E	400	400	-384.4	784.4	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: PILLIGA SANDSTONE Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:78 Base Elevation: +322 Thickness: 78 #
Geologic Description: MEDIUM TO COARSE,CROSSBEDDED QUARTZ SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # NOT TOTAL THICKNESS SINCE DRILLHOLE PRECOLLARED INTO UNIT SURAT BASIN UNIT

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:230 Base Elevation: +170 Thickness: 152
Geologic Description: INTERMEDIATE - ALKALINE LAVA AND PYROCLASTIC BRECCIA
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:349.5 Base Elevation: +40.5 Thickness: 119.5
Geologic Description: SILTSTONE,SILTSTONE-SANDSTONE LAMINITE AND SANDSTONE
Reported Environment: BAY SILT TO TIDAL/INTERTIDAL MUDFLAT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:531.5 Base Elevation: -131.5 Thickness: 172
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE AND SANDSTONE
Reported Environment: TERRESTRIAL CONGLOMERATE,FLUVIAL CONGLOMERATE AND SANDSTONE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:730 Base Elevation: -330 Thickness: 11
Geologic Description: QUARTZ LITHIC SANDSTONE,BURROWED AND BIOTURBATED
Reported Environment: TOP OF MARINE TRANSGRESSION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK GM. CORRELATES WITH BULGA FM-ARCHERFIELD SST

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:781 Base Elevation: -381 Thickness: 250

Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL,UNCORRELATED(9)	654	-254	4.8
	COAL, HOSKISSONS(16)	715.2	-315.2	8.1

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -384 * Thickness:)3
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks NOT PENETRATED. TD IS 784.4 M

CONTROL POINT: TULLAMULLEN DDH 1

REFERENCE # G2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-12	30 37'55"S	149 52'47"E	270	270	-126.2	396.2	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:66 Base Elevation: 204 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:102.5 Base Elevation: 167.5 Thickness: 36.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:118 Base Elevation: 152 Thickness: 15.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:146.3 Base Elevation: 123.7 Thickness: 2.3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:204 Base Elevation: +66 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HOSKISS'N U(1)	128.5	141.5	2.8
COAL, HOSKISS'N L(2)	134.9	135.1	1.14

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:264 Base Elevation: +6 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:338 Base Elevation: -68 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:361.1 Base Elevation: -91.1 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:363.7 Base Elevation: -93.7 Thickness: 2.6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGABRI VOLCANICS Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -126 # Thickness:)32.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN UNIT.

CONTROL POINT: TURRAWAN DDH 2A

FERENCE # G1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/55-12	30 22'36"S	149 50'45"E	240	240	-448.5	688.5	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code: Y101
Basal Information: Depth to Base: 6.5 Base Elevation: +233.5 Thickness: 6.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PURLAWAUGH FM Age: JURASSIC Interpretation Code: Y102
Basal Information: Depth to Base: 115 Base Elevation: +125 Thickness: 108.5
Geologic Description: LITHIC SANDSTONE CLAYSTONE AND MINOR COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, UNNAMED SM (1) 108.8 +131.2 1.6
Tectonic Structure:
Remarks COAL PROBABLY CORRELATES WITH WALOON COAL MEASURES SURAT BASIN UNIT

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code: Y103
Basal Information: Depth to Base: 284.5 Base Elevation: -44.5 Thickness: 169.5
Geologic Description: SILTSTONE, SILTSTONE-SANDSTONE LAMINITES AND SANDSTONE
Reported Environment: BAY TO TIDAL-INTERTIDAL MUDFLAT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code: Y104
Basal Information: Depth to Base: 308.6 Base Elevation: -68.6 Thickness: 23.6
Geologic Description: POLYMICTIC PEBBLE CONGLOMERATE
Reported Environment: TERRESTRIAL AND FLUVIAL CONGLOMERATE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code: Y105
Basal Information: Depth to Base: 389 Base Elevation: -149 Thickness: 80.4
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, HOSKISSONS (2) 316.7 -76.7 8.7
COAL, MELVILLES (3) 384.2 -144.2 1.4
Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:537.5 Base Elevation: -297.5 Thickness: 198
Geologic Description:
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:586 Base Elevation: -346 Thickness: 48.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAULES CREEK FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:648 Base Elevation: -408 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
UNNAMED COAL SEAM(9)	628	-388	1.70
UNNAMED SEAM (11)	638.7	-398.7	1.7

Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:686.5 Base Elevation: -446.5 Thickness: 38.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WALLA WALLA DDH 1

REFERENCE # G3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/55-12	30 44'12"S	149 52'38"E	280	280	-171.7	451.65	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code: Y101
Basal Information: Depth to Base: 30 Base Elevation: 250 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code: Y102
Basal Information: Depth to Base: 159 Base Elevation: 121 Thickness: 129*
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
INTRUSION	159	121	41

Tectonic Structure:
Remarks THICKNESS INCLUDES 41 METRE INTRUSION WITH BASE AT 159 METRES.

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: 166.5 Base Elevation: 113.5 Thickness: 7.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARKARULA SST Age: PERMIAN Interpretation Code: Y104
Basal Information: Depth to Base: 233.8 Base Elevation: 46.2 Thickness: 5.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITHIN BLACK JACK COAL MEASURES

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code: Y105
Basal Information: Depth to Base: 264 Base Elevation: +16 Thickness: 97.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, HOSKISS'N U(1)	208.7	+71.3	1.88
COAL, HOSKISS'N L(2)	215.9	+64.1	4.09

Tectonic Structure:
Remarks

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:356 Base Elevation: -76 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:397 Base Elevation: -117 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER COAL MEASURES Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:443 Base Elevation: -163 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -172 * Thickness:)8.65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NOT TOTAL THICKNESS AS HOLE TERMINATED IN THIS UNIT

CONTROL POINT: WIDDEN DDH 2

REFERENCE # G41

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 34'00"S	150 19'04"E	+253	+254	+28	226	

REFERENCE: HOLMES, C.G.
COULBURN VALLEY COAL DRILLING OPERATIONS BY THE NEW SOUTH WALES DEPARTMENT OF MINES DURING 1973 AND 1974
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1975/001. Page Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:17 Base Elevation: +237 Thickness: 16
Geologic Description: LAMINITE OF M GREY SLTST AND V-FV OFF-WH TO YEL-BN SST. BEDDING SLIGHTLY DISTURBED. IRON STAINED.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:205 Base Elevation: +49 Thickness: 204
Geologic Description: F-M SST AND SLTST, M-C SST AND CGL, MDST CLST AND COAL. INTBDD-LAND, DISTURBED, LOW ANGLE XBDG. CARB-COALY PART, DESSICATION CRACKS, PLANTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	67	+187	1.64
COAL	86	+168	1
COAL	156	+98	4.4
COAL, BAYSWATER SM	178	+76	7.73

Tectonic Structure:
Remarks BURROWS, MINOR ROOT PEM, MICAC, TRAC, IRON AND SID ZONES. 13 COAL SMS, MOST 0.5-1.0 M THICK. DENMAN FM AT TOP.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:205 Base Elevation: +49 Thickness: 204
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WITTINGHAM CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +28 * Thickness: >21
Geologic Description: MDST, VF-M SST, SLTST. INTBDD-LAND. DISTURBED BDG, CARB PARTINGS, MACERATED PLANTS IN SST-SLTST; IRON RICH ZONES AND CARBONATE REPLACEMENT(MDST)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +28 * Thickness: >21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS MULBRING SILTSTONE.

CONTROL POINT: WILSON DDH 1

REFERENCE # G26

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH + WIRELINE LOGS	SH/55-16	31 24'00"S	149 45'10"E	440	440	-319.8	759.8	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

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Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: GARRAWILLA VOLCANICS Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:148 Base Elevation: +292 Thickness: 148
Geologic Description: INTERMEDIATE AND ALKALINE LAVAS AND BRECCIAS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPERBY FORMATION Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:298 Base Elevation: 142 Thickness: 150
Geologic Description: SILTSTONE,SILTSTONE-SANDSTONE LAMINITE AND MINOR CLAYSTONE AND SANDSTONE
Reported Environment: MARINE TO BRACKISH, BAY SILTS AND INTERTIDAL MUDFLATS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DIGBY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:444 Base Elevation: -4 Thickness: 146
Geologic Description: CONGLOMERATE AND COARSE GRAINED SANDSTONE
Reported Environment: FLUVIAL CONGLOMERATE AND SANDSTONE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK JACK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:591 Base Elevation: -151 Thickness: 147
Geologic Description:
Reported Environment: DELTA PLAIN
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, UNNAMED SM (8)	524.3	-84.3	3.3
COAL, HOSKISSONS(14)	571.5	-131.5	5.1
COAL,HOSK L.SPLT(15)	573.6	-133.6	1.77
INTRUSION	506	-66	29

Tectonic Structure:
Remarks COAL SM ALSO AT 578.2M DEPTH, 2.2M THICK.

STRATIGRAPHY: WATERMARK FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:656 Base Elevation: -216 Thickness: 65
Geologic Description: SILTY SANDSTONE,SILTSTONE AND CLAYSTONE
Reported Environment: PRODELTA AND DELTA FRONT SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: PORCUPINE FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:744 Base Elevation: -304 Thickness: 88
Geologic Description: BIOTURBATED AND BURROWED,SILTY QUARTZ-LITHIC SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LEARD FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:755 Base Elevation: -315 Thickness: 11
Geologic Description: PELLETOIDAL CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGABRI VOLCANICS Age: PERMIAN Interpretation Code:Y10B
Basal Information: Depth to Base:TD Base Elevation: -320 * Thickness: >4.8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * NOT PENETRATED.TERMINAL DEPTH 759.8 METRES HIGHLY WEATHERED

CONTROL POINT: WINGEN

REFERENCE # 653

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION	SH/56-13	31 51'20"S	150 58'15"E	+460	+460	+354		

REFERENCE: BRITTEN, R.A.
SINGLETON-MUSWELLBROOK DISTRICT. IN TRAVES, D.M., & KING, D., 1975, ECONOMIC GEOLOGY OF AUSTRALIA AND PAPUA NEW GUINEA. 2. COAL
AUSTRALASIAN INSTITUTE OF MINING & METALLURGY MONOGRAPH SERIES NO. 6 Page 194 Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: KOOGAH FM Age: PERMIAN Interpretation Code:
Basal Information: Depth to Base: Base Elevation: +354 Thickness: 100
Geologic Description: COAL SEAMS, M-C MASSIVE SST, MINOR CONGLOMERATE, RARE SILTSTONE AND SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS GEN ABOUT 20 DGS, BUT UP TO 35 DGS
Remarks EQUIVALENT TO GRETA CM. BASE ELEVATION BASED ON APPARENT THICKNESS OF 106 M (DIP=20 DGS)

CONTROL POINT: YARRARI DDH 1

REFERENCE # G6

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SH/56-9	30 50'48"S	150 15'37"E	270	270	+104.1	165.9	

REFERENCE: Y101 WEBER, C.R., BECKETT, J., HAMILTON, D.

ABSTRACTS PROC. 16TH NEWCASTLE SYMPOSIUM Page Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: GUNNEDAH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code:Y101
Basal Information: Depth to Base:148 Base Elevation: +122 Thickness: 148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOGGARRI VOLCANICS Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: 104.1* Thickness: >17.9
Geologic Description: ALTERED (CHLORITE) BASIC VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * NOT PENETRATED. TERMINAL DEPTH 165.9 METRES

GLOUCESTER

BASIN

(SYDNEY, NTH: GLOUCESTER)

CONTROL POINT: GLOUCESTER BASIN

REFERENCE # 522

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW UNIV. TECH.	GENERALISED SECTION	SI/56-2	32 07'15"S	151 56'30"E	+120 ?	+120 ?	-1812	1732	

REFERENCE: LOUGHNAN, F.C.
THE PERMIAN COAL MEASURES OF THE STROUD-GLOUCESTER TROUGH
JOURNAL + PROCEEDINGS, ROYAL SOCIETY OF NEW SOUTH WALES, VOL.88 Page 106-113 Publn Year: 1954
Cross Reference: GEORGE, A.M., 1975, IN TRAVES + KING, AUS. I.M.M. MONOGRAPH SERIES NO.6, 255-258

SEDIMENTARY BASIN: GLOUCESTER

STRATIGRAPHY: CRAVEN CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:950 Base Elevation: -830 Thickness: 950
Geologic Description: CARBONACEOUS SHALES, COAL SEAMS, COALY BEDS, ARKOSIC SANDSTONES, UNSTRATIFIED CONGLOMERATE, AND MUDSTONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks OVERLAIN BY CAINOZOIC SEDIMENTS. REF ELEV QUOTED ABOVE APPROX. EQUALS BROAD GULLY FM, SPRING CK CGL + CRAVEN CM OF REF.

STRATIGRAPHY: WARDS RIVER CGL Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1017 Base Elevation: -897 Thickness: 67
Geologic Description: MASSIVE CLIFF-FORMING CONGLOMERATES WITH PEBBLES OF VOLCANIC ORIGIN, WITH TWO HORIZONS OF INTERBEDDED SHALES AND COALY BANDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS: 45 DG WEST + 47 DG EAST
Remarks

STRATIGRAPHY: GLOUCESTER CK Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1597 Base Elevation: -1477 Thickness: 580
Geologic Description: INTERCALATED SANDSTONES AND COAL BEARING STRATA
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL: 15 SEAMS T'OUT
Tectonic Structure: MINOR FAULTING + BUCKLING. DIP 55 DG SW
Remarks COAL SEAMS RANGE FROM 0.6-2.5 M THICK. CALLED AVON COAL MEASURES BY LOUGHNAN

STRATIGRAPHY: DEWRANG FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -1812 Thickness: 335
Geologic Description: INTBDD SST, CARB SH WITH PLANTS, VOLC PDL CGL + THIN COAL SMS. THICKER COAL SM, + M-C SST PBLY IN PLACES + LOCALLY GRADING TO CGL. WELL BDD
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL:"30 FOOT SEAM" 1750 -1630
Tectonic Structure: FAULTED B'DARIES WITH ALUM MTN VOLCS
Remarks UNDERLAIN BY ALUM MOUNTAIN VOLCANICS. FOLLOWING COAL DATA FROM GEORGE, 1975

MYALL

SYNCLINE

(SYDNEY, NTH: MYALL SYNC.)

CONTROL POINT: MYALL SYNCLINE

REFERENCE # S23

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNIV. NEWCASTLE	GENERALISED SECTION	SI/56-2	32 24'40"S	152 12'30"E		+60 CA	-862	922 CA	

REFERENCE: ENGEL, B.A.
GEOLOGY OF THE BULAHDELAH-PORT STEPHENS DISTRICT, N.S.W.
JOURNAL + PROCEEDINGS, ROYAL SOCIETY OF NEW SOUTH WALES, VOL.95 Page 197-215 Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: MYALL SYNCLINE

STRATIGRAPHY: BULAHDELAH FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:910 Base Elevation: -850 Thickness: 910
Geologic Description: IRON STAINED CALCAREOUS SST WITH MARINE FAUNA, GREY-GREEN FINE GRAINED ARENITES WITH DISTINCT PEBBLE BANDS, AND SILTY AND SANDY SHALES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GOOD OUTCROP ON EAST LIMB OF SYNCLINE. THE REFERENCE ELEVATION QUOTED ABOVE IS APPROXIMATE. THICKNESS APPROXIMATE.

STRATIGRAPHY: MARKWELL CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -862 Thickness: 12
Geologic Description: PEBBLE + BOULDER CONGLOMERATES, ARENITES SHOWING CURRENT-BEDDING + CONTAINING IMPURE COAL SEAMS, AND SHALES CONTAINING GLOSSOPTERIS SOME MOSTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNDERLAIN BY CARBONIFEROUS ALUM MOUNTAIN VOLCANICS. THICKNESS APPROXIMATE.

SYDNEY

BASIN

NORTH

CONTROL POINT: A.A. CO.'S DEEP BORE

REFERENCE # S57 Y1
REFERENCE # S57 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. AGRIC. CO.	CALYX BORE	SI/56-2	32 55'50"S	151 46'07"E		+1	-914	915	?

REFERENCE: Y1 ENGEL, B.A.
NEWCASTLE, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-2 Page Publn Year: 1966
Cross Reference: DAVID, T.W.E., 1907, GEOL. SURV. N.S.W., MEM. 4(1)

REFERENCE: Y2 HAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page PLATE 3 Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:21 Base Elevation: -20 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:81 Base Elevation: -80 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL: BOREHOLE SEAM 64 -63 6
Tectonic Structure:
Remarks THESE FORMATION PICKS USED FOR STRUCTURE AND ISOPACH MAPS. COAL INFORMATION FROM DAVID, 1907.

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -914 * Thickness:)834
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:Y201
Basal Information: Depth to Base:18 Base Elevation: -17 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:TD Base Elevation: -914 * Thickness:)897
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ALLANDALE

REFERENCE # S29

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION	SI/56-1	32 42'00"S	151 25'03"E	76	76	-65	141	

REFERENCE: OSBORNE, G.D.
THE STRATIGRAPHY OF THE LOWER MARINE SERIES OF THE PERMIAN SYSTEM IN THE HUNTER RIVER VALLEY, NEW SOUTH WALES
PROCEEDINGS OF THE LINNEAN SOCIETY NEW SOUTH WALES 74 Page 203-223 Publn Year: 1949

Cross Reference: PACKHAM, G.H., 1969. THE GEOLOGY OF NEW SOUTH WALES. P 320

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:141 Base Elevation: -65 Thickness: 141
Geologic Description: CONGLOMERATES WITH TUFF, SANDSTONE, SHALE, AND MUDSTONE. MARINE FOSSILS, GLACIAL ERRATICS. EUREDESMA BED (18") BETWEEN 65-111 M DEPTH.
Reported Environment: MARINE-LITTORAL DURING GLACIAL CONDITIONS AND VOLCANISM.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFFS	19	57	16
EURYDESMA BED	65-111		0.5
TUFF	117	-41	6

Tectonic Structure: WEST FLANK LOCHINVAR ANTICLINE
Remarks THICKNESSES ASSUMED TRUE. BASAL BDS OVERLIE LOCHINVAR FM OF LOCHINVAR SECTION. SECTION TOP NEAR HARPURS HILL

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -65* Thickness: >141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS ALLANDALE FM. REFER TO LOCHINVAR SECTION FOR POSSIBLE BASAL EXTENSION.

CONTROL POINT: BAYSWATER 2 OPEN CUT

REFERENCE # S4

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BAYSWATER COLL.	MINE SECTION	SI/56-1	32 21'00"S	150 54'00"E		+780	+595	185	

REFERENCE: X1 DIESSEL, C.F.K.
EXCURSION SYNOPSIS
16TH NEWCASTLE SYMPOSIUM Page FIG. 2 Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:30 Base Elevation: +750 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GROUND ELEVATION FROM 1:250000 TOPO. SHEET, TAKING TOP OF GRETA CM AT +750 M APPROX.

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:30 Base Elevation: +750 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BRANXTON FM

STRATIGRAPHY: ROWAN FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:140 Base Elevation: +640 Thickness: 110
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SKELETAR FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: +595 * Thickness: >45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: +595 * Thickness: >155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROWAN & SKELETAR FORMATIONS

CONTROL POINT: BAYSWATER BMK 1

REFERENCE # S6

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	DDH, CORED	SI/56-1	32 24'40"S	151 01'55"E	+115	+115	-342	457	

REFERENCE: BURSILL, C., VEEVERS, J.J., KONECKI, M.C., CRESPIN, I., ET AL.
OPEN CUT COAL INVESTIGATIONS CESSNOCK MUSWELLBROOK REGION. PARNELL'S CREEK AREA COMPLETION REPORT. PART I. NORTHERN PROSPECT
BUREAU OF MINERAL RESOURCES, AUSTRALIA RECORDS 1952/76 Page 55; PL 8 Publn Year: 1953

Cross Reference: BOOKER, F.W., BURSILL, C., & MCELROY, C.T., 1954, J. PROC. ROY. SOC. N.S.W., 87, 137-151

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:382 Base Elevation: -267 Thickness: 382
Geologic Description: CYCLIC SEDIMENTATION OF GREYWACKE SS AND COAL WITH LESSER SLTST, CLST, AND SH. LOWER 23 M (BAYSWATER BD) TRANSITIONAL WITH MULBRING SLTST.
Reported Environment: UPPER PART TERRESTRIAL, LOWER PART (BAYSWATER) BRACKISH.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	30	+85	3
COAL	53	+62	6
COAL, ARTIES SM	253	-138	7
COAL, U. LIDDEL SM	268	-153	1

Tectonic Structure:
Remarks EQUIVALENT TO TOMAGO CM AND BAYSWATER BED IN REFERENCE REPORT. L. LIDDEL SM 4M THICK 289M BASE; BARRETT SM 1M, 302M.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:382 Base Elevation: -267 Thickness: 382
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS WITTINGHAM CM (TOMAGO CM AND BAYSWATER BED OF REFERENCE REPORT)

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -342 # Thickness: >75
Geologic Description: BLACK CLAYSTONE GRADING UPWARDS INTO BLACK SHALE AND GREY-BLACK CLAYSTONE. PYRITIC, SILICEOUS, MARINE MICROFOSSILS. TRAC IN BOTTOM
Reported Environment: MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -342 # Thickness: >75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS MULBRING SLTST

CONTROL POINT: BELFORD 1

REFERENCE # S27 Y1
REFERENCE # S27 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-1	32 39'23"S	151 17'05"E	74	76	-1099	1175	?

REFERENCE: Y1 ROYD, B.R.
A.O.G. BELFORD NO. 1 WELL SYDNEY BASIN, N.S.W. WELL COMPLETION REPORT
AUSTRALIAN OIL AND GAS CORP. LTD UNPUBLISHED COMPANY REPORT(RPT 64/4109) Page Publn Year: 1965
Cross Reference:

REFERENCE: Y2 OZIMIC, S.
PETROLOGICAL STUDY OF BELFORD (A.O.G) NO. 1 WELL, SYDNEY BASIN, NSW.
BUREAU OF MINERAL RESOURCES, AUSTRALIA, RECORD 1968/68 Page Publn Year: 1968
Cross Reference: MAYNE, E.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:435 Base Elevation: -359 Thickness: 432
Geologic Description: INTBDD LT-M GREY SLTST, GL-LI SS, AND SH; CGL; MINOR COAL. SCATTERED PBLS, RARE PYRITIZED LIGNITE FRAG, THIN COAL BANDS, MARINE FOSSILS
Reported Environment: MARINE WITH TERRESTRIAL TONGUES
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	404	-328	1
COAL	426	-350	1

Tectonic Structure:
Remarks ELDERSLIE FM IN COMPLETION REPORT

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:435 Base Elevation: -359 Thickness: 432
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS BRANXTON FM.

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:490 Base Elevation: -414 Thickness: 55
Geologic Description: POORLY SORTED LT GY SS GRADING FROM F SAND TO CGL. LITHIC GRAINS AND CHERT PBLS COMMON. CARB AND NON-CARB SH, COAL SMS
Reported Environment: TERRESTRIAL PARALIC FACIES
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	438	-362	3.4
COAL	446	-370	3
COAL	461	-385	2
COAL	467	-391	2

Tectonic Structure:
Remarks

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:686 Base Elevation: -610 Thickness: 196
Geologic Description: GREY, MOSTLY M GRAINED QZ-LI SS BECOMING CGL IN PARTS AND ASSOCIATED GY-BLK SLTS AND SH. ARGIL MATRIX, VARIABLY CARB, MICAC, FORMS PRESENT.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:688 Base Elevation: -610 Thickness: 180
Geologic Description: VF GRAINED VOLC-LITHIC-FLED GWKE, LAM AND LENSES OF SIDERITIC-PY SLTST AND SANDY-PURE SID ROCK. CARB, FINE PY, FORAMS, PLANT FRAG(IN SID LENSES)
Reported Environment: INTERMITTENTLY QUIET TO AGITATED MARINE WATERS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNIT B5

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1135 Base Elevation: -1059 Thickness: 449
Geologic Description: LT GREY SS, SLTST, AND SH. SS IS QZ TO QZ-LI, F GRAINED AND WELL SORTED TO POORLY SORT AND PBLY. SLTST AND SH MORE CARB DOWNWARD. FORAMS PRESENT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: ~1099* Thickness: >40
Geologic Description: VOLCANICS. ANDESITIC BRECCIA AND LAVA, LT GREY TO GREY-GREEN, FINELY GARNETIFERROUS TOWARDS THE BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: ~1099* Thickness: >685
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY, RUTHERFORD, AND ALLANDALE FORMATIONS.

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:393 Base Elevation: -317 Thickness: 391
Geologic Description: PALE GY TO BR QZ AND LI GREYWACKE WITH SCATTERED PBLS. SOME LAM AND BURROWS. SIDERITIC, CARB, CHLORITIC, LOCALIZED BRYOZOA HORIZON
Reported Environment: AGITATED TO QUIET MARINE. SOME CURRENT ACTION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
MARINE FOSS(BRYOZOA) 94 -18 6
COAL, LIGNITE 314 -238
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNIT B1 AND ELDERSLIE FM.

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:393 Base Elevation: -317 Thickness: 391
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BRANXTON FM

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:506 Base Elevation: -430 Thickness: 113
Geologic Description: INTBDD LITHIC-FELD GWKE WITH ABUNDANT CHERT PBLS, CARB SLTST, COAL, LAM BDG, PY, SID. COAL IN MIDDLE IS CLEANER THAN ELSEWHERE(UNIT B3 435-459M)

Reported Environment: DELTAIC SWAMPS IN WHICH SUBSIDENCE IS NOT KEEPING PACE WITH SEDIMENTATION. BOTTOM TRANSITIONAL BETWEEN MARINE DALWOOD GP AND TERRESTRIAL GRETA.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SILTY	427	-351	2
COAL, VITREOUS	437	-361	3
COAL, VITREOUS	446	-370	4
COAL, SILTY	456	-390	2

Tectonic Structure:
Remarks: EQUIVALENT TO BMR UNITS B2-B4. FORMATION PICKS USED FOR STRUCTURE AND ISOPACH MAPS.

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1135 Base Elevation: -1059 Thickness: 449
Geologic Description: DK GY, MICAC, VOLC-LITHIC GWKE WITH THIN SLTST BDS AND LAM, LENSES OF PURE TO SANDY SID, MINOR COAL BNDS AND QZ AND CHERT PBL HORIZONS. CARB, PY
Reported Environment: MARGINAL MARINE SUBJECT TO SHARP CHANGES IN ENERGY
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: EQUIVALENT TO BMR UNIT B6. BOUNDARY BETWEEN B5-B6 LARGELY ON FELD CONTENT. RUTHERFORD HAS RARE FORAMS AND PLANT FRAG.

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:TD Base Elevation: -1099+ Thickness:)40
Geologic Description: HIGHLY ALTERED PORPHYRITIC VOLCANIC ROCK, POSSIBLY OF INTERMEDIATE COMPOSITION. SOME FLOW STRUCTURES. GREENISH-GREY
Reported Environment: NOT ABLE TO DETERMINE WHETHER A FLOW OR INTRUSION. EQUIVALENT UNITS IN LODER # 1 MAY BE LAVA FLOWS AND TUFFS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: EQUIVALENT TO BMR UNIT B7.

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:TD Base Elevation: -1099+ Thickness:)669
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS FARLEY, RUTHERFORD, AND ALLANDALE FORMATIONS.

CONTROL POINT: BLACK HILL DDH 1

REFERENCE # S2 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	DDH	SI/56-1	32 17'49"S	150 53'34"E	+153	+153	+52	101	&Z

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: ROGIS, J., 1978, GEOL. SURV. N.S.W. REPORT 1978/279

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:49 Base Elevation: +104 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:49 Base Elevation: +104 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BRANXTON Fm

STRATIGRAPHY: ROWAN FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: +52 * Thickness:)52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BRANXTON/ROWAN CONTACT MAY BE FAULTED

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: +52 * Thickness:)52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROWAN FM

CONTROL POINT: BLACK HILL DDH 1,3

REFERENCE # S2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref.El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	DDH	SI/56-1	32 17'49"S	150 53'34"E	+153	+153	-78	231	C

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: ROGIS, J., 1978, GEOL. SURV. N.S.W. REPORT 1978/279

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:49 Base Elevation: +104 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:49 Base Elevation: +104 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BRANXTON FM

STRATIGRAPHY: ROWAN FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:190 Base Elevation: -37 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BRANXTON/ROWAN CONTACT (DDH1) MAY BE FAULTED

STRATIGRAPHY: SKELETAR FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -78 * Thickness: >41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -78 * Thickness: >182
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROWAN FM & SKELETAR FM

CONTROL POINT: BLACK HILL DDH 3

REFERENCE # S2 B	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	GEOL. SURV. NSW	DDH	SI/56-1	32 18'13"S	150 53'41"E	+167	+167	+18	149	#

REFERENCE: THIS REPORT — Page — Publn Year:

Cross Reference: ROGIS, J., 1978, GEOL. SURV. N.S.W. REPORT 1979/279

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY:	ROWAN FM	Age: PERMIAN	Interpretation Code:	X101
Basal Information:	Depth to Base: 107	Base Elevation: +60	Thickness:	107
Geologic Description:				
Reported Environment:				
Interpreted Environment:				
Geologic Features:	Feature	Depth	Elevation	Thickness
Tectonic Structure:				
Remarks				

STRATIGRAPHY:	SKELETAR FM	Age: PERMIAN	Interpretation Code:	X102
Basal Information:	Depth to Base: TD	Base Elevation: +18 #	Thickness:	)42
Geologic Description:				
Reported Environment:				
Interpreted Environment:				
Geologic Features:	Feature	Depth	Elevation	Thickness
Tectonic Structure:				
Remarks				

STRATIGRAPHY:	GRETA CM	Age: PERMIAN	Interpretation Code:	X103
Basal Information:	Depth to Base: TD	Base Elevation: +18 #	Thickness:	)149
Geologic Description:				
Reported Environment:				
Interpreted Environment:				
Geologic Features:	Feature	Depth	Elevation	Thickness
Tectonic Structure:				
Remarks	CONTAINS ROWAN FM & SKELETAR FM			

CONTROL POINT: BOGGY CREEK RDH 1

REFERENCE # 556

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	RDH, CORED	SI/56-2	32 59'20"S	151 30'24"E		+31	-122	153	

REFERENCE: ROGIS, J.
THE EAST MAITLAND COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT NO. GS 1976/090 (MICROFICHE) Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF NEWCASTLE CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:27 Base Elevation: +4 Thickness: 27
Geologic Description: COAL, OFF-WHITE, ORANGE-BROWN + BLK CARB CLSTS, DK GY-BLK CARB MDST, + MID GREY, S'TIMES MICACEOUS SLTST WITH CARBONACEOUS AND COALY FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	5	+26	1.5
COAL (70%)	24	+7	4.4
COAL (70%)	27	+4	1.8

Tectonic Structure:
Remarks

STRATIGRAPHY: WARATAH SST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:50 Base Elevation: -19 Thickness: 23
Geologic Description: F-M LT GY SST AT TIMES VF CLAYEY SL MICAC, M CLAYEY LT-M GY LI SST, M-DK GY MICAC SLTST, M-C MID BR SST, M-DK GY MDST, COAL. CARB FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:50 Base Elevation: -19 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED NEWCASTLE COAL MEASURES + WARATAH SANDSTONE

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:136 Base Elevation: -105 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -122# Thickness:)17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: TOWAGO CM Age: PERMIAN Interpretation Code:Y186

Basal Information: Depth to Base:TD Base Elevation: -122m Thickness: >183

Geologic Description: COAL,WH-GY & BLK CARB CLST, VF SILTY, F, F-M LI, & C-VC, LT-M GY CARB MICAC SST, M&DK GY CARB & LT-M GY MICAC SLTST, DK GY-BLK MDST

Reported Environment:

Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL (80%)	53	-22	1.5
DOLERITE	106	-75	24
COAL SM	114	-83	0.75
KULNURA MARINE TNG	153	-122	>17

Tectonic Structure:

Remarks ALSO CONTAINS LT GY-BR & M-DK GY MICAC CARB MDST & DOLERITE. PLANT FOSS ILS, X&DG, BIOTURBATION. 0.34 M COAL SM AT 121M

CONTROL POINT: BRUSH CREEK DDH 1

REFERENCE # 551

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-5	33 09'17"S	151 15'50"E	41	41	-604	645	

REFERENCE: CRAWFORD, E.A.
THE COORANBONG-KULNURA COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/362 (MICROFICHE) Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: PATONGA CLST Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:60 Base Elevation: -19 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TUGGERAH FM Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:253 Base Elevation: -212 Thickness: 193
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUNMORAH CGL Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:390 Base Elevation: -349 Thickness: 137
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:390 Base Elevation: -349 Thickness: 398
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PATONGA CLST, TUGGERAH FM, MUNMORAH CGL

STRATIGRAPHY: WARATAH SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:468 Base Elevation: -427 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF NEWCASTLE CM

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:468 Base Elevation: -427 Thickness: 78

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WARATAH SST AT BASE

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Yi07
Basal Information: Depth to Base:554 Base Elevation: -513 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Yi08
Basal Information: Depth to Base:TD Base Elevation: -604 * Thickness: >91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Yi09
Basal Information Depth to Base:TD Base Elevation: -604 * Thickness: >177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UPPER TOMAGO CM AND KULNURA MARINE TNG.

CONTROL POINT: BUNGAREE NORAH

REFERENCE # S63

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NORAH MINES SYND	DDH	SI/56-5	33 16'28"S	151 33'52"E	6	6	-342	348	

REFERENCE: Y1 BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
1:250,000 GEOLOGICAL SERIES EXPLANATORY NOTES SYDNEY SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES Page TABLE 3 Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: Y110
Basal Information: Depth to Base: 99 Base Elevation: -93 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code: Y120
Basal Information: Depth to Base: TD Base Elevation: -342* Thickness:)249
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks USED FOR NEWCASTLE ISOPACH

CONTROL POINT : CAMBERWELL 1

REFERENCE # S17 Y1
REFERENCE # S17 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-1	32 32'30"S	151 06'09"E	+88	+92	-1815	1907	?

REFERENCE: Y1 WRIGHT, A.J., AND STUNTZ, J.
AUSTRALIAN OIL + GAS CORPORATION LIMITED CAMBERWELL NO.1 WELL, SYDNEY BASIN, N.S.W., WELL COMPLETION REPORT
AUSTRALIAN OIL + GAS CORP. LTD UNPUBLSIHED REPORT. (BMR FILE 65/4179) Page Publn Year: 1966
Cross Reference:

REFERENCE: Y2 MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S. AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page PLATE 3 Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:239 Base Elevation: -147 Thickness: 235
Geologic Description: LT GY, FINELY MICAC, PARTLY SANDY (PBLY IN PLACES), SL CARB SLTST WITH SPARSE GY-WH, F GR, POORLY SORTED SST INTBDS. RARE FOSSIL FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUREE SANDSTONE Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:305 Base Elevation: -213 Thickness: 66
Geologic Description: SANDY BEDS WITH SOME PEBBLES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1047 Base Elevation: -955 Thickness: 742
Geologic Description: GY + LT GY MICAC FINELY SANDY SLTSTS WITH PBL + SHELL FRAGS, BLK COAL, LT GY-WH F-VF SST LOCALLY C-CGL, GY-WH F POORLY SRTD, + LT GY F PBLY SSTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	690	-598	7
COAL INTERVAL	867	-775	8.5
COAL	882	-790	3

Tectonic Structure:
Remarks EQUIVALENT TO BELFORD + ELDERSLIE FORMATIONS OF COMPLETION REPORT

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1047 Base Elevation: -955 Thickness: 1043
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE, MUREE SANDSTONE + BRANXTON FORMATION

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1186 Base Elevation: -1094 Thickness: 139

Geologic Description: GY-GN, WELL CONSOLIDATED, PEBBLE CONGLOMERATE (PBLS OF CHERT, SST + QZITE), COAL, GY-WH, F-M GRAINED, POORLY SORTED SANDSTONE, + SHALE BANDS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1052	-960	4
COAL	1073	-981	2
COAL	1091	-999	4
COAL	1107	-1015	2

Tectonic Structure:
Remarks: ALSO, 2M COAL AT -1053 (1145 M DEPTH)

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1322 Base Elevation: -1230 Thickness: 136
Geologic Description: LIGHT GREY, F-VF GRAINED, SILTY, SLIGHTLY CALCAREOUS SANDSTONE WITH TRACE GREY LITHICS. WELL CONSOLIDATED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1824 Base Elevation: -1732 Thickness: 502
Geologic Description: GY-DK GY PARTLY SANDY OR PBLY, FINELY CARB SLTST, THIN GY-WH VF-F LI CARB SST INTBS, DK GY-BLK FINELY MICAC PARTLY SILTY SL CARB SHALE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1807	-1715	3

Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANDALE-LOCHINVAR Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1815? Thickness:)83
Geologic Description: LIGHT GREEN CRYSTALLINE TUFF + ANDESITIC LAVAS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THIS UNIT IS PROBABLE EQUIVALENT OF ALLANDALE + LOCHINVAR FORMATIONS

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1815? Thickness:)721
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS FARLEY + RUTHERFORD FMS, + UNDIFF ALLANDALE-LOCHINVAR FMS

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:239 Base Elevation: -147 Thickness: 235
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:658 Base Elevation: -566 Thickness: 419
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:658 Base Elevation: -566 Thickness: 654
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE + BRANXTON FORMATION

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:1186 Base Elevation: -1094 Thickness: 528
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THESE FORMATION PICKS USED FOR STRUCTURE AND ISOPACH MAPS.

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1322 Base Elevation: -1230 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1824 Base Elevation: -1732 Thickness: 502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANDALE-LOCHINVAR Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:TD Base Elevation: -1815* Thickness: >83
[illegible]ic Description:
[illegible]ted Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED ALLANDALE + LOCHINVAR FORMATIONS

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -1815* Thickness: >721
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY + RUTHERFORD FMS, + UNDIFF. ALLANDALE-LOCHINVAR FMS

CONTROL POINT: CESSNOCK DDH 1

REFERENCE # S38

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-1	32 52'42"S	151 23'38"E	+76	+76	-296	372	

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: DEPT MIN. N.S.W., 1890, ANN. REPT., P.155 // DEPT MIN. N.S.W., 1891, ANN. REPT., APPENDIX D, DIAG. 7

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:324 Base Elevation: -248 Thickness: 324
Geologic Description: SST, SHALY SST, BLUE SH, BLUE SLTST & BANDS OF CGL. CESSNOCK SST MB: SHALY & GREY SSTS & CGL (SOME IN BANDS) (DEPT MIN. N.S.W., 1890 & 1891)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CESSNOCK SST MB?	324	-248	22

Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:324 Base Elevation: -248 Thickness: 324
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS BRANXTON FM

STRATIGRAPHY: PAXTON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:342 Base Elevation: -266 Thickness: 18
Geologic Description: CGL, COARSE SST, FINE CGL, PY & COAL BANDS, CLAYSTONE. "COAL PIPES" IN C SST & F CGL. POSSIBLE X-BDG. (DEPT MIN. N.S.W., 1891)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF GRETA CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -296 * Thickness:)30
Geologic Description: COAL (OFTEN PYRITIC), BLACK, GREY & BLUE SHALES, CLAYSTONE, SANDSTONE AND CONGLOMERATE (DEPT MIN. N.S.W., 1891)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM	349	-273	7
COAL	356	-280	0.6

Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -296 * Thickness:)48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:

Remarks: CONTAINS PAXTON FM & UNDIFF GRETA CM

CONTROL POINT: COORANBONG DDH 1

REFERENCE # S54

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-5	33 04'19"S	151 26'14"E	12	12	-563	575	

REFERENCE: CRAWFORD, E.A.
THE COORANBONG-KULNURA COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/362 (MICROFICHE) Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: MUNMORAH CGL Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:154 Base Elevation: -142 Thickness: 154
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: BASE OF NARRABEEN GP

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:154 Base Elevation: -142 Thickness: 154
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS MUNMORAH CGL

STRATIGRAPHY: WARATAH SST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:262 Base Elevation: -250 Thickness: 19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: BASE OF NEWCASTLE CM

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:262 Base Elevation: -250 Thickness: 108
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS WARATAH SST AT BASE. WALLARAH SM ABSENT AT TOP; INDICATES PROBABLE UNCONFORMITY WITH OVERLYING NARRABEEN GP

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:353 Base Elevation: -341 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:506 Base Elevation: -494 Thickness: 153

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER TOMAGO CM Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -563 ft Thickness: >69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:TD Base Elevation: -563 ft Thickness: >313
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UPPER TOMAGO CM, KULNURA MARINE TNG, LOWER TOMAGO CM.

CONTROL POINT: CRANKY CORNER

REFERENCE # S19

Organisation	Type	Mapnr	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNIV. NEWCASTLE	SECTION	SI/56-1	32 33'15"S	151 24'00"E		+300	+300		

REFERENCE: SLEE, K.J.
THE GEOLOGY OF THE CRANKY CORNER BASIN, NEW SOUTH WALES
B.SC. (HONS.) THESIS, UNIVERSITY OF NEWCASTLE (UNPUBLISHED) Page SECTION A Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: CRETA CM Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: Base Elevation: +300 Thickness: 334
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: OVERLAIN BY BRANXTON FM (SLEE'S BIG TABLE TOP FM) & UNDERLAIN BY DALWOOD GP. ELEVATION APPROXIMATE

CONTROL POINT: DENMAN DDH 7

REFERENCE # S9

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 27'51"S	150 39'58"E	105	106	-466	572	

REFERENCE: Y1
STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT OF MINES 1968-1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT 1972/445 Page Publn Year: 1972
Cross Reference: COAL STRATEGY DIVISION, NSW DEPT MINES, PERSONAL COMMUNICATION

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:107 Base Elevation: -1 Thickness: 20
Geologic Description: MEDIUM SANDSTONE, LT GREY, CARB PARTINGS, FISSILE IN UPPER PART, MASSIVE IN LOWER PART.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:107 Base Elevation: -1 Thickness: 107
Geologic Description: INTBDD-LAMD F-M SST, MDST, CLST, SLTST, COAL. CARB, TFAC. COAL GENERALLY INFERIOR.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 1	63	43	4
COAL, SM 2	72	34	2
COAL, SM 3	78	28	2

Tectonic Structure:
Remarks WATTS SST AT BASE

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:154 Base Elevation: -48 Thickness: 47
Geologic Description: F-M SANDSTONE WITH MDST INTBDS-LAM AND CLST-SLTST LAMINITE. BIOTURBATED, SIDERITE REPLACEMENT.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: ARCHERFIELD SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:555 Base Elevation: -449 Thickness: 9
Geologic Description: F-M SST, SLTST, COAL, MDST. INTBDD, LAMD, MICRO XBDD. BURROWS, SAND-FILLED CRACKS, SMALL DIAPIRIC STRUCTURES, CARB, ROOT AND PLANT REMAINS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 20	554	-448	0.6

Tectonic Structure:
Remarks FINING UP SEQ OF M-C SST, F-M SST & SLTST, MDST NOTICED ABOVE COAL SM(S.R.). FM IN WITTINGHAM CM

STRATIGRAPHY: BULGA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:569 Base Elevation: -463 Thickness: 14
Geologic Description: F SST, SLTST, MDST, CLST, COAL, IGNEOUS ROCK. INTBDD-LAMD, CHURNED, BREDCIATED (BASAL MDST). CARB PART, ROOT AND PLANT REM, SID REPLACEMENT.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 21	558	-452	1.5

	IGNEOUS ROCK	565	-459	1.8

Tectonic Structure:
Remarks: WITTINGHAM CM. IGNEOUS ROCK IS PORPHYRITIC.

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -466% Thickness: >465
Geologic Description: F-M SST, SLTST, MDS., COAL, SOME CLST, IGNEOUS ROCK, LAMINITE. INTBDD-LAMD, CHURNED, MICRO XBDD, BRECCIATED. CARB, TFAC(TOP), SID, PLANTS, ROOTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth T'OUT	Elevation	Thickness
IGNEOUS ROCK	446	-340	1
COAL, BAYSWATER SM	545	-439	5.7
IGNEOUS ROCK	565	-459	1.8

Tectonic Structure:
Remarks: BAYSWATER SM INTRUDED BY IGNEOUS ROCK. CONTAINS DENMAN FM, ARCHERFIELD SST AND BULGA FM.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:TD Base Elevation: -466% Thickness: >571
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS WOLLOMBI AND WITTINGHAM CM

CONTROL POINT : DOORALONG DDH 1

REFERENCE # 552

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-5	33 11'50"S	151 21'27"E	37	37	-644	681	

REFERENCE: CRAWFORD, E.A.
THE COORANBONG-KULNURA COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/362 (MICROFICHE) Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: TUGGERAH FM Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:219 Base Elevation: -182 Thickness: 219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUNMORAH CGL Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:371 Base Elevation: -334 Thickness: 152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:371 Base Elevation: -334 Thickness: 371
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TUGGERAH FM, MUNMORAH CGL.

STRATIGRAPHY: WARATAH SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:459 Base Elevation: -422 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:459 Base Elevation: -422 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WARATAH SST AT BASE

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:656 Base Elevation: -619 Thickness: 197

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KULNURA MARINE TNC Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -644 ft Thickness: >25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y10B
Basal Information: Depth to Base:TD Base Elevation: -644 ft Thickness: >222
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UPPER TOMAGO CM AND KULNURA MARINE TNC

CONTROL POINT: DOYLES CREEK DDH 11

REFERENCE # S24

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED+ WIRELINE	SI/56-1	32 41'51"S	151 00'27"E	+78	+80	-1018	1098	

REFERENCE: STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT. OF MINES 1968 TO 1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 (MICROFICHE) Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: GLEN GALLIC SUB-GP Age: PERMIAN Interpretation Code:
Basal Information: Depth to Base:121 Base Elevation: -41 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GREIGS CREEK COAL, REDMANVALE CREEK FM,DIGHTS CREEK COAL (WOLLOMBI CM)

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:67 Base Elevation: +13 Thickness: 65
Geologic Description: M-VC SANDSTONE AND CONGLOMERATE. WITH FINER SANDSTONE, SILTSTONE, MUDSTONE INTBDS. THICK (8M) BASAL CGL. PBLS OF RED AND GN CHERTS, WHITE CLST.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SURFACE ELEVATION OF CONTROL POINT IS APPROXIMATE.

STRATIGRAPHY: GREIGS CREEK COAL Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:68 Base Elevation: +12 Thickness: 1
Geologic Description: DULL TO BRIGHT COAL WITH INTBDS OF DK GREY OR BROWN CARBONACEOUS CLAYSTONE WITH COALY LAMINAE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: REDMANVALE CREEK FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:90 Base Elevation: -10 Thickness: 22
Geologic Description: M-C SANDSTONE AND CONGLOMERATE WITH MINOR MUDSTONE AND COAL INTBDS-LAM. SST IS QZ-LITHIC; CGL HAS DOMINANTLY GY SLTST PBLS IN SST MATRIX
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: DIGHTS CREEK COAL Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:121 Base Elevation: -41 Thickness: 31
Geologic Description: 3 MAJOR SMS OF DULL AND DULL-BRIGHT COAL SEPARATED BY MASC SS AND INTBDD-LAM SS, TUFFITE, SLTST, AND MDST. TFITE IS WH AND INTBDD WITH CYST-MDST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 2, DULL	93	-13	3
COAL, SM 3, DULL-BRT	101	-21	3
TUFFITES	105	-25	3
COAL, SM 4, DULL-BRT	121	-41	6

Tectonic Structure:

Remarks WOLLOMBI CM

STRATIGRAPHY: WATERFALL GULLY FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:135 Base Elevation: -55 Thickness: 14
Geologic Description: INTBDD-LAM F-VF SANDSTONE, SILTSTONE, MUDSTONE, COAL, TUFF. PLANT FRAGMENTS, ROOT REMAINS, CARBONACEOUS
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	TUFF	135	-55	7

Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: PINE GROVE FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:180 Base Elevation: -100 Thickness: 45
Geologic Description: M-C MASS SS (TOP), INTBDD-LAM FINE SS SLTST MDST TUFF, 3 MAJOR COAL SMS. SEDIMENTS ARE LI-BZ, CARB, CONTAIN PLANT FRAG SID BANDS-NOD. COAL D-BRT
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	TUFF, GRADES SS TOP	158	-78	8
	COAL, SM 5	160	-80	1
	COAL, SM 6	162	-82	<1
	COAL, SM 7	163	-83	<1

Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: DOYLES CREEK SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:180 Base Elevation: -100 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS WATERFALL GULLY AND PINE GROVE FM. (WOLLOMBI CM)

STRATIGRAPHY: LUCERNIA COAL Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:198 Base Elevation: -118 Thickness: 18
Geologic Description: COAL AND INTBDD-LAM FINE SS, SLTST, MDST, CLST, AND TUFF. SEDIMENT ARE CARB AND CONTAIN PLANT FRAGMENTS. COAL GEN DULL AND INFERIOR, SID, CALC.
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, SM 8 DULL-BRT	183	-103	1
	COAL, SM 9 DULL-BRT	189	-109	<1
	COAL, SM 10 INFERIOR	194	-114	3
	COAL, SM 11 BRT-DULL	198	-118	2

Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: STRATHMORE FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:219 Base Elevation: -139 Thickness: 21
Geologic Description: INTBDD-LAM CLAYSTONE, MUDSTONE, COAL, AND SANDSTONE. LT GREY (SS) TO DK GY AND BLK. CARB, TFAC, SOME SIDERITE REPLACEMENT AND MICRO FUALTS.
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	TUFF (BURROWED)	212	-132	1

Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: ALCHERINGA COAL Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:233 Base Elevation: -153 Thickness: 14
Geologic Description: COAL AND INTBDD-LAM CLAYSTONE, SILTSTONE, SANDSTONE, AND TUFF. TFAC, CARB, SIDERITE, PLANT FRAG. COAL GENERALLY DULL, DIRTY. SOME BRT IN SM 14.

Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 12	219	-139	<1
TUFF	221	-141	<1
COAL, SM 13	225	-145	5
COAL, SM 14	233	-153	5

Tectonic Structure:
Remarks: WOLLOMBI CM

STRATIGRAPHY: CLIFFORD FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:291 Base Elevation: -211 Thickness: 58
Geologic Description: COAL WITH INTBDD-LAM F-M SS CLST SLTST AND MDST; M-C MASS SS AND CLG OCCURS BETWEEN SMS 16-17 AND 18-19. COAL GEN DULL-BRT. SEDS CARB TFAC SID.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 15	247	-167	3
COAL, SM 16	256	-176	4
COAL, SM 17	282	-202	6
COAL, SM 18	291	-211	2

Tectonic Structure:
Remarks: WOLLOMBI CM

STRATIGRAPHY: HORSESHOE CK SUB-GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:291 Base Elevation: -211 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS LUCERNIA COAL, STRATHMORE FM, ALCHERINGA COAL, CLIFFORD FM (WOLLOMBI CM)

STRATIGRAPHY: CHARLTON FM Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:309 Base Elevation: -229 Thickness: 18
Geologic Description: INTBDD-LAM F-M SANDSTONE AND MUDSTONE. CARB, PLANT REMAINS, SIDERITE REPLACEMENT, IN PART BIOTURBATED AND TUFFACEOUS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: WOLLOMBI COAL MEASURES

STRATIGRAPHY: ABBEY GREEN COAL Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:317 Base Elevation: -237 Thickness: 8
Geologic Description: COAL AND INTBDD-LAM F SANDSTONE, SILTSTONE, AND CLAYSTONE. COAL DULL TO BRIGHT, CALCITE IN CLEAT. SEDS CARB, TFAC, PLANT FRAG.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 19	311	-231	2

Tectonic Structure:
Remarks: WOLLOMBI CM

STRATIGRAPHY: APPLE TREE FLAT S-GP Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:317 Base Elevation: -237 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS CHARLTON FM AND ABBEY GREEN COAL (WOLLOMBI CM)

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y117
Basal Information: Depth to Base:343 Base Elevation: -263 Thickness: 26
Geologic Description: F-M, LT GREY TO BROWNISH SANDSTONE. COALY LAMINAE, TUFFACEOUS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y118
Basal Information: Depth to Base:343 Base Elevation: -263 Thickness: 276
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y119
Basal Information: Depth to Base:366 Base Elevation: -286 Thickness: 23
Geologic Description: LAMINITE OF F LT GREY SS AND LT-DK GREY-BLK SLTST AND MDST. SMALL SCALE EROSIONAL FEATURES, X-BDG IN SS, BURROWS, CONTORTED BDG, SIDERITE ZONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WITTINGHAM CM

STRATIGRAPHY: MALABAR FM Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:604 Base Elevation: -524 Thickness: 238
Geologic Description: SANDSTONE AND COAL, SST IS M-C TO CGL, MASS WITH CARB PARTINGS AND EROSIONAL BASE OR F-M AND INTBDD-LAM WITH CLST SLTST MDST. SID,TF,PLANT FRAG
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
WYBROW COAL MB	441	-361	69
REDBANK COAL MB	483	-403	39
WAMBO COAL MB	543	-463	15
WHYNOT COAL MB	580	-500	25

Tectonic Structure:
Remarks SMS 20,21,22 IN WYBROW COAL MB; SMS 23,24 IN REDBANK; SMS 25,26 IN WAMBO; SMS 27, 28 IN WHYNOT

STRATIGRAPHY: MT OGILVIE FM Age: PERMIAN Interpretation Code:Y121
Basal Information: Depth to Base:707 Base Elevation: -627 Thickness: 103
Geologic Description: THIN INTBDD-LAM F-M SS, SLTST, CLST, AND COAL; LESSER M-C SS, MASS BDG, CARB PART, ROOT AND PLANT REMAINS, DISTURBED BDG, WORM BURROWS, SIDERITE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BLAKEFIELD COAL MB	608	-528	4
GLEN MUNRO COAL MB	658	-578	4
WOODLANDS HILL COAL	707	6273	49

Tectonic Structure:
Remarks NUM CLST INTBDS IN BLAKEFIELD (SM 29) AND GLEN MUNRO (SM 30). THICKER COAL IN WOODLANDS HILL (SMS 31, 32)

STRATIGRAPHY: BURNHAMWOOD FM Age: PERMIAN Interpretation Code:Y122
Basal Information: Depth to Base:1064 Base Elevation: -984 Thickness: 356
Geologic Description: INTBDD-LAM F-M SS SLTS CLST AND COAL, SOME M-C MASS SS. CARB PART AND FRAG, PLANT AND ROOT REMAINS, DISTRUBED BDG, WORM BURROWS, SID, MICROBREC.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MT ARTHUR COAL MB	770	-690	26
PIERCEFIELD COAL MB	885	-805	79

	BROONIE COAL MB	1033	-953	45
	BRAYSWATER SM (46)	1664	-984	9

Tectonic Structure:
Remarks MT ARTHUR COAL SMS 33 34 35, PIECEFIELD SMS 36 37 38, VAUX SMS (NOT ABOVE) 39 40, BROONIE SMS 42 43 44 45.

STRATIGRAPHY: ARCHERFIELD SST Age: PERMIAN Interpretation Code:Y123
Basal Information: Depth to Base:1078 Base Elevation: -998 Thickness: 14
Geologic Description: SANDSTONE, GENERALLY COARSE AND FINING TOWARD BASE. COALY PARTINGS COMMON IN TOP, SPORADIC T'OUT. WORM BURROWS/
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULGA FM Age: PERMIAN Interpretation Code:Y124
Basal Information: Depth to Base:TD Base Elevation: -1018* Thickness: >20
Geologic Description: F-C SANDSTONE INTBDD-LAM WITH MDST. SS IS LITHIC, MUDDY-PBLY, LAM-MASS. CARB PARTINGS, WORM BURROWS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: VANE SUB-GROUP Age: PERMIAN Interpretation Code:Y125
Basal Information: Depth to Base:TD Base Elevation: -1018* Thickness: >20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BULGA FM

STRATIGRAPHY: WITTINGHAM GM Age: PERMIAN Interpretation Code:Y126
Basal Information: Depth to Base:TD Base Elevation: -1018* Thickness: >755
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS DENMAN, KALABAR, MT OGILVIE, BURNHAMWOOD, ARCHERFIELD, AND BULGA FORMATIONS.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y127
Basal Information: Depth to Base:TD Base Elevation: -1018* Thickness: >1031
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM GM.

CONTROL POINT: DOYLES CREEK DDH 2

REFERENCE # S12

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-1	32 35'46"S	150 43'24"E	150 CA	+151	-387	538	

REFERENCE: STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY NSW DEPT OF MINES DURING 1968 TO 1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT 1972/445 (MICROFICHE) Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:289 Base Elevation: -138 Thickness: 19
Geologic Description: SANDSTONE, M-F GRAINED, LT GREY, QZ-LITHIC. INTBDS AND LAMINATIONS OF DARK GREY CARB SLTST AND CARB MATERIAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASAL FM OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:289 Base Elevation: -138 Thickness: 288 CA
Geologic Description: INTBDD-LAM SS SLTST CLST COAL INTRUS TUFFITES. LAM BDG PROMINENT; SOME THICKER GRADED QZ-LI SST. COMMONLY TFAC, PLANT FOSS
Reported Environment: GRADED POINT BAR DEPOSIT (BASAL CGL-F SS) REPORTED FROM 49-61 M DEPTH
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 7 MAJOR SMS	T'OUT		1-6 M
TUFF, GREENISH	49	102	2
TUFF, GREENISH	91	60	5
BASIC INTRUS AND SS	244	-93	56

Tectonic Structure:
Remarks WATTS SST AT BASE. COAL IS DIRTY, DULL-BRIGHT, CALCITE IN CLEATS, ASSOC WITH CLST

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:381 Base Elevation: -230 Thickness: 92
Geologic Description: INTBDD-LAM SS AND SLTST AT TOP; LITHIC, CARB, ARGIL (BENTONITE) TFAC, VF-M GRAINED. BOTTOM INTBDD CLST AND MDST AND BASIC INTRUS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASIC INTRUSIVE	381	-230	13

Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -387# Thickness:)249
Geologic Description: SS SLTST MDST CLST AND COAL. INTBDD-LAMINATED, CONTORTED BDG. SS AND SLTST ARE LITHIC-QZ LI, MICAC(BDT). CARB, TFAC, PLANT FOSS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 3 MAJOR SEAMS			2-5
INTRUSIVE AND COAL	383	232	1
TUFFITE AND CLST	493	-342	)1
CONGLOMERATE	497	-346	)1

Tectonic Structure:
Remarks DENMAN FM AT TOP. BASE DEPTH OF COAL SMS 41M (5M THICK),447(1),483(2). DULL-BRIGHT WITH CLST PARTINGS

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -387# Thickness:)537

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM GM

CONTROL POINT: DOYLES CREEK DDH 3

REFERENCE # S13

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH, CORED	SI/56-1	32°34'52"S	150°48'38"E		126	-231	357	

REFERENCE: Y1 STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT MINES DURING 1968-1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:37 Base Elevation: 89 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -231 Thickness:)357
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 9 SEAMS	T'OUT		
TUFF	344	-218	9.5

Tectonic Structure:
Remarks OTHER THINNER TUFFS PRESENT. COAL ANALYSIS AVAILABLE

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -231 Thickness:)357
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI CM

CONTROL POINT: DOYLES CREEK DDH 4

REFERENCE # 516

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-1	32 32'20"S	150 55'51"E	+175	+177	-523	700	

REFERENCE: STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT. OF MINES 1968 TO 1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 (MICROFICHE) Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:42 Base Elevation: +135 Thickness: 40
Geologic Description: SANDSTONE AND CONGLOMERATE. SS IS QZ-LITHIC, CLAYEY, LT BN-PINKY BN, F-VC GRAINED. CGL PBLS OF ACID VOLC AND GN-PURP CHERTS. CARB LAM,PLANT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:42 Base Elevation: +135 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WATTS SST. SURFACE ELEVATION OF CONTROL POINT IS APPROXIMATE.

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:108 Base Elevation: +69 Thickness: 66
Geologic Description: INTBDD-LAM SS AND SLTST, SS, AND SLTST-MDST LAMINATE. SS IS F-M GRAINED, QZ-LITHIC, PINK-BN TO GY. SLTST DK GREY. CARB, NUM PLANT IMPRESSIONS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:680 Base Elevation: -503 Thickness: 638
Geologic Description: INTBDD-LAM SS SLTST MDST, COAL, CGL, INTRUS, DOLERITE, MINOR TUFF LST. BDG THIN-LAM, SOME MASS, OBLIQUE, BIOTURB. CARB, PLANT FOSS,SOME SID PY.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	199	-22	<1
TUFF INTRUS DOLERITE	476	-299	52
COAL AND INTRUS	539	-362	4
COAL AND INTRUSIVES	591	-414	4

Tectonic Structure:
Remarks DENMAN FM AT TOP. 27 COAL SMS; BAYSWATER SM 547M DEPTH TO BASE, 1M THICK

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:680 Base Elevation: -503 Thickness: 678
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS WOLLOMBI AND WITTINGHAM CM. SURFACE ELEVATION OF CONTROL POINT IS APPROXIMATE

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -523 # Thickness: >20
Geologic Description: M-DK GREY SILTSTONE. TOP OF SECTION EXTENSIVLEY BIOTURB, SIDERITE ZONE, LAMINITE AND CONTORTED BDG. BOTTOM HAS FINE SS LAM, PYRITE, TUFFAC CLAY.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MAITLAND GROUP

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -523 # Thickness: >20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SLTST.

CONTROL POINT: DOYLES CREEK DDH 6

REFERENCE # S11

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-1	32 30'58"S	150 47'34"E	+133	+134	-593	727	

REFERENCE: STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS. BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT MINES DURING 1968 - 1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT 1972/445 (MICROFISCHE) Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:188 Base Elevation: -54 Thickness: 22
Geologic Description: LT GY-GN SS, COARSE AT TOP BECOMING FINER TOWARD BASE. DK GY CLAYEY LAMINAE AND PARTING BECOME MORE NUM AT BASE FORMING LAMINITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:188 Base Elevation: -54 Thickness: 186
Geologic Description: THIN-THICK INTBDD MDST CLST COAL SS AND SLTST. LITHIC SS, SLTST S'TIMES INTLAM. COAL ASSOC WITH CLST AND MDST. CARB, TFAC, NUM PLANT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	23	+111	7
COAL, SM 2	34	+100	6
COAL, SM 3	88	+46	8
TUFF	145	-11	1

Tectonic Structure:
Remarks BASAL FORMATION IS WATTS SS. OTHER COAL AT 103M AND 114M DEPTH ARE 5 AND2 M DEPTH.

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:245 Base Elevation: -111 Thickness: 58
Geologic Description: IRREG INTBNDD-LAM F-VF GRAINED SS AND DK GREY CLST. CLST BECOMES DOMINANT AT BASE. MICRO-RIPPLES, BURROWING. SIDERITIC CLAY BODIES T'OUT.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -593 # Thickness: >539
Geologic Description: INTBDD-LAM SS SLTST CLST MDST COAL AND MINOR SH. INTRUS IN LOWER PART. CARB, BIOTURB(TOP), SID BNDS-NOD(COMMON IN TOP), PLANT,FOSS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, 11 MAJOR SMS	T'OUT		1-7 M
TUFF	593	-459	3
QUARTZITE + INTRUS.	719	-585	2
INTRUSIVES, ALTERED	TD		>8

Tectonic Structure:
Remarks HIGHER % CLASTICS IN WITTINGHAM THAN WOLLOMBI; SS SLTST ARE PREDOM QZ-LI. DENMAN FM AT TOP. GN CHERTS, ZEOLITES (INTRUS)

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD- Base Elevation: -593 # Thickness: >727
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM COAL MEASURES.

CONTROL POINT: DOYLES CREEK DDH 9

REFERENCE # S48

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH, CORED	SI/56-1	32 47'10"S	151 06'13"E		86	-954	1043	

REFERENCE: Y151 STUNTZ, J.
HUNTER VALLEY COAL DRILLING OPERATIONS BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF SCOUT BORES DRILLED BY THE NSW DEPT MINES DURING 1968-1971
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1972/445 Page Pubin Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code: Y101
Basal Information: Depth to Base: 79 Base Elevation: 7 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base: 271 Base Elevation: -185 Thickness: 12?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: 271 Base Elevation: -185 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 13 SMS T'OUT
Tectonic Structure:
Remarks CONTAINS WATTS SST AT BASE

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code: Y104
Basal Information: Depth to Base: 343? Base Elevation: -257? Thickness: 72?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code: Y105
Basal Information: Depth to Base: 1029 Base Elevation: -943 Thickness: 758
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, 46 SEAMS T'OUT
COAL, BAYSWATER SM 761 -675 ?
Tectonic Structure:
Remarks CONTAINS DENMAN FM AT TOP

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1029 Base Elevation: -943 Thickness: 958
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WOLLOMBI AND WITTINGHAM CM

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -954% Thickness:)14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DUCKHOLE BORE 1

REFERENCE # S32

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NCASTLE STOCKTON	DDH	SI/56-2	32 47'00"S	151 49'15"E		+7	-238	245	

REFERENCE: ENGEL, B.A.
NEWCASTLE, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-2 Page Publn Year: 1966
Cross Reference: DEPT MINES N.S.W., 1890, ANNUAL REPORT P.194 // DAVID, T.W.E., 1907, GEOL. SURV. N.S.W. MEM. 4(1)

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:46 Base Elevation: -39 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:230 Base Elevation: -223 Thickness: 184
Geologic Description: DK BL SH, CARB SH, SANDY SH, SHALY SST, GY CALC SST, C GRITTY GY CALC SST, COAL, FIRECLAY, IRONSTONE, CONGLOMERATE. GLOSSOPTERIS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	128	-121	0.2
COAL AND BANDS	145	-138	0.65
COAL	166	-159	0.15
DARK CONGLOMERATE	230	-223	3

Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM DEPT MINES ANN. REPT, 1890, 194. COAL INFORMATION FROM SAME ANNUAL REPORT (1890) + DAVID, 1907

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:230 Base Elevation: -223 Thickness: 184
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOMAGO COAL MEASURES

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -238 * Thickness: 215
Geologic Description: DARK SANDY MICACEOUS SHALE, DARK SHALY CONGLOMERATE, AND FIRECLAY. MARINE FOSSILS (DEPT MINES ANN. REPT, 1890, 194)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PRODUCTUS BRACHYTHAERUS (DAVID, 1907)

CONTROL POINT: EAST MAITLAND 1

REFERENCE # S34 Y1
REFERENCE # S34 Y2
REFERENCE # S34 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PLANET OIL CO.	RDH, CORE + WIRELINE	SI/56-2	32 45'47"S	151 37'05"E	+5	+9	-3040	3049	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149
Page PLATE 2 Publn Year: 1974
Cross Reference: JENSEN, A.R. + BRYAN, R., 1969, BMR RECORD 1969/14

REFERENCE: Y2
ENGEL, B.A.
NEWCASTLE, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-2
Page Publn Year: 1966
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:57 Base Elevation: -48 Thickness: >53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:1462 Base Elevation: -1453 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GRETA CM TOP AT -1387 M.

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:58 Base Elevation: -49 Thickness: 54
Geologic Description: INTERBEDDED SANDSTONE, SILTSTONE AND SILTY CLAYSTONE. PLANT FRAGMENTS AND COALY & CARBONACEOUS SEDIMENTS OCCUR (JENSEN & BRYAN, 1969).
Reported Environment: SWAMPY ENVIRONMENT WITH TOO MUCH TERRIGENOUS SEDIMENTATION FOR THE DEVELOPMENT OF PURE COAL SEAMS (JENSEN & BRYAN, 1969).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:586 Base Elevation: -577 Thickness: 528
Geologic Description: V CARB SLTST-SILTY SST, SANDY SLTST, VF SST, MDST, CALC SUBGWKE. SST[illegible] [illegible]OZOSE. PY, CARB, MICAC. PBLY TOWARDS BASE. BIOTURB. MARINE FOSSILS.
Reported Environment: MARINE ENVIRONMENT BELOW WAVE BASE IN AN AREA PROTECTED FROM STRONG [illegible] [illegible]IGHTLY STPONGER CURRENTS FOR BASAL SEQ. (JENSEN & BRYAN, 1969).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonit Structure:
Remarks GEOLOGIC DESCRIPTION ALSO FROM JENSEN & BRYAN (1969).

STRATIGRAPHY: MUREE SANDSTONE Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:768 Base Elevation: -759 Thickness: 182
Geologic Description: F-M GR PROTOQZITE, QZ GR SHOWING INTERLOCKING FABRIC. RARE FLD + VOLC LITHICS. SIL, SID, CALCITE, DAWSONITE CEMENT. ABUNDANT FOSSILS IN PLACES.
Reported Environment: OPEN MARINE CONDITIONS - PROBABLY SHELF DEPOSITION WITH QUITE SHALLOW WATER. NON-FOSSILIFEROUS INTERVALS - POSSIBLY BEACH OR DUNE ENVIRONMENT.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION + REPORTED ENVIRON FROM JENSEN & BRYAN, 1969.

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1396 Base Elevation: -1397 Thickness: 628
Geologic Description: F + V POORLY SRTD QZ GWKES, GWKE + SANDY SLTST. MARINE FOSSILS. CARB WITH PLT FRAGS, ?ROOTLETS, CHURNED BDG, XLAMN + VARIABLY MUDDY MTRX AT BASE
Reported Environment: SHALLOW MARINE ENVIRONMENT, POSSIBLY ESTUARINE NEAR BASE (JENSEN & BRYAN, 1969).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM JENSEN & BRYAN, 1969.

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1396 Base Elevation: -1387 Thickness: 1338
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE, MUREE SANDSTONE & BRANXTON FORMATION.

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1462 Base Elevation: -1453 Thickness: 66
Geologic Description: V POORLY SRTD PETROMICTIC PBL CGL-PBLY LI GWKE WITH QZ, FLD, XL TUFF, CHERT + SLTST CLASTS, & F CARB LI GWKE WITH SED + VOLC LITHICS. COAL SEAM.
Reported Environment: MARINE AND/OR TRANSITIONAL ENVIRONMENT LAST STAGES OF MAJOR REGRESSION (JENSEN & BRYAN, 1969).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1420 -1411 5
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM JENSEN & BRYAN, 1969.

STRATIGRAPHY: FARLEY-RUTHERFORD Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1887 Base Elevation: -1878 Thickness: 425
Geologic Description: F LI GWKE + SANDY SLTST, V CARB TOWARDS BASE. SID & PY COMMON. QZ + SOME VOLC LI CLASTS. CARB FRAGS COMMON. BRACHIOPOD FRAGS. VESICULAR BASALT.
Reported Environment: LOW ENERGY COASTAL ENVIRON SUCH AS LARGE ESTUARY WHERE SED BEING CONTINUALLY DEPOSITED & REWORKED & WHERE SURROUNDING SWAMPS SUPPLY CARB MATTER.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
BASALT 1744 -1735 4.3
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION + REPORTED ENVIRONMENT FROM JENSEN & BRYAN, 1969. REPRESENTS UNDIFF FARLEY & RUTHERFORD FMS.

STRATIGRAPHY: ALLANDALE-LOCHINVAR Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -3040± Thickness: >1162
Geologic Description: BASIC & INTERMED PYROCLASTICS, PETROMICTIC VOLC PBL CGL, SILTY MDST, GWKE, SANDY SLTST, F SLTST & SILTY SST INTBDD. SOME CARB PY. CARBONATE CMT.
Reported Environment: PROBABLY MARINE (JENSEN & BRYAN, 1969).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM JENSEN & BRYAN, 1969. REPRESENTS UNDIFFERENTIATED ALLANDALE & LOCHINVAR FORMATIONS.

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -3040± Thickness: >1587
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFF FARLEY-RUTHERFORD FMS & UNDIFF ALLANDALE-LOCHINVAR FMS.

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:58 Base Elevation: -49 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1417 Base Elevation: -1408 Thickness: 1359
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1461 Base Elevation: -1452 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:TD Base Elevation: -3040# Thickness: >1588
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GARRETTS TUNNEL

REFERENCE # S31

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION (IN SHAFT)	SI/56-2	32 41'54"S	151 48'22"E	25	25			

REFERENCE: Y1 DAVID, T.W.E.
GEOLOGY OF THE HUNTER RIVER COAL MEASURES
GEOLOGICAL SURVEY OF NEW SOUTH WALES MEMOIR 4 Page 110, 117 Publn Year: 1907

Cross Reference: RATTIGAN, J.H., 1966 JOURNAL AND PROCEEDINGS ROYAL SOCIETY OF NEW SOUTH WALES 1 0 1 00 75-84.

SEDIMENTARY BASI : SYDNEY, NORTH

STRATIGRAPHY: GARRETTS SEAM Age: PERMIAN Interpretation Code: Y101
Basal Information: Depth to Base: Base Elevation: 25 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO REIDS DOME BEDS. OVERLAIN BY ABOUT 760 M OF VOLCANICS

CONTROL POINT : GOSFORTH

REFERENCE # S36	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
		SECTION	SI/56-1	32 42'17"S	151 28'48"E	40	40	-332	372	

REFERENCE: OSBORNE, G.D.
THE STRATIGRAPHY OF THE LOWER MARINE SERIES OF THE PERMIAN SYSTEM IN THE HUNTER RIVER VALLEY, NEW SOUTH WALES
PROCEEDINGS OF THE LINNEAN SOCIETY NEW SOUTH WALES 74 Page 203-223 Publn Year: 1949

Cross Reference: PACKHAM, G.H., 1969. THE GEOLOGY OF NEW SOUTH WALES. P 320

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: LOCHINVAR FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:372 Base Elevation: -332 Thickness: 372
Geologic Description: BASALT, SANDSTONE, SHALE, AND LIMESTONE, TUFFACEOUS, CARB, PLANT FOSS, MARINE FOSS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASALT,BASIC-TF,MDST	52	-12	52
TUFFS WITH BASALT	52	-12	52
LIMESTONE	101	-61	3
BASALT	345	-305	183

Tectonic Structure: STRIKE E 15-25 DG, DIP 50 DG SE
Remarks THICKNESS CITED IN TEXT ASSUMED TO BE TRUE. CONSIDERED TYPICAL OF BASAL LOCHINVAR FM ON EAST LIMB OF LOCHINVAR DOME

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:372 Base Elevation: -332 Thickness: 372
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS LOCHINVAR FM. LOCATION OF TOP OF SECTION: JUST NORTH OF MAIN ROAD 1.8 MILES FROM INTERSECTION WITH GOSFORTH RD

CONTROL POINT: GRETA DDH 1

REFERENCE # S28

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-1	32°39'36"S	151°22'52"E	+55	+55	-343	398	

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: DEPT MIN. N.S.W., 1891, ANN. REPT., APPENDIX D, DIAG. 9

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:364 Base Elevation: -309 Thickness: 364
Geologic Description: SST, CGL, SHALY SST & BLUE SLTST. SHALY SST & BLUE SLTST COMMONLY HAVE CGL PATCHES. CESSNOCK SST MB: FINE CGL. (DEPT MIN. N.S.W., 1891)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CESSNOCK SST MB?	364	-309	3

Tectonic Structure:
Remarks: SHALY SST & BLUE SLTST WITH CGL PATCHES COULD BE DIAMICTITE

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:364 Base Elevation: -309 Thickness: 364
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS BRANXTON Fm

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -343 * Thickness: 34
Geologic Description: COAL, DARK SHALE, CLAYSTONE, HARD CONGLOMERATE, CLAY SHALE, SANDSTONE AND SHALY SANDSTONE (DEPT MIN. N.S.W., 1891)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	368	-313	3.9
COAL	373	-318	1.2
COAL	384	-329	0.4
COAL	394	-339	1.0

Tectonic Structure:
Remarks:

CONTROL POINT : HIGHER MACDONALD 1

REFERENCE # S4R

Organisation	Type	Mapp.	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-5	33 12'55"S	150 55'53"E	+18	+21	-607	628	

REFERENCE: BOYD, B.R., AND HEISLER, H.H. (AUSTRALIAN OIL + GAS CORP. LTD)
A.O.G. HIGHER MACDONALD NO.1, WELL COMPLETION REPORT
UNPUBLISHED REPORT. BMR FILE 68/2037 Page Publn Year: 1968

Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: ALLUVIUM Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:24 Base Elevation: -3 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:589 Base Elevation: -568 Thickness: 565
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -607 + Thickness: +39
Geologic Description: F-M + SILTY OR M-C CLAY CEMENTED SST, GY-GN + SHALY OR GY BR-BLK AND CARB SILTSTONE, GY-BR, GY + GN SHALE, AND BLACK, VITREOUS COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	590	-569	1
COAL	600	-579	1.2
COAL	614	-593	1.3

Tectonic Structure:
Remarks

CONTROL POINT: HOWES SWAMP 1

REFERENCE # S47 Y1
REFERENCE # S47 Y2
REFERENCE # S47 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO EXPL & PROD	RDH, WIRELINE	SI/56-5	33 07'58"S	150 41'37"E	+308	+313	-2257	2570	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
GENTILE, D.J., AND DAY, R.W.
ESSO HOWES SWAMP NO. 1, SYDNEY BASIN, NEW SOUTH WALES, FINAL SUBSIDY REPORT
ESSO EXPLORATION + PRODUCTION AUSTRALIA INC. UNPUB REPT, BMR FILE 70/139 Page Publn Year: 1970
Cross Reference:

REFERENCE: Y2
MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOUCES BULLETIN 149 Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NEWCASTLE CM EQUIVAL Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:928 Base Elevation: -615 Thickness: 186
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM EQUIVALENT Age: PERMIAN Interpretation Code:X120
Basal Information: Depth to Base:1602 Base Elevation: -1289 Thickness: 674
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X125
Basal Information: Depth to Base:1602 Base Elevation: -1289 Thickness: 860
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ILLAWARRA CM TOP AT -429 M.

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:12 Base Elevation: +301 Thickness: 7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:742 Base Elevation: -429 Thickness: 730
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST (12-96 M) AND NARRABEEN GROUP (96-742 M)

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1602 Base Elevation: -1289 Thickness: 860
Geologic Description: INTBDD BUFF-LT GY LI VF-M (CGL IN PART) - VF SILTY CARB ARG PY SST, M-DK GY SILTY CARB SH, GY ARG SANDY CARB SLTST, BLK VIT-DULL COAL, LIGNITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAM 1058 -745 12
COAL SEAM 1103 -790 18
Tectonic Structure:
Remarks COAL SEAMS THROUGHOUT

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1859 Base Elevation: -1546 Thickness: 257
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUREE SANDSTONE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1872 Base Elevation: -1559 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "NOWRA SANDSTONE EQUIVALENT" IN COMPLETION REPORT

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:2149 Base Elevation: -1836 Thickness: 277
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "WANDRAWANDIAN FORMATION" IN COMPLETION REPORT

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2149 Base Elevation: -1836 Thickness: 547
Geologic Description: INTBDD LT-DK GY ARG CARB MICROMICAC CALC PY SLTST, M-DK GY SILTY SH, BUFF-LT BR GY LI-WACKE F-C (CGL IN PART) SST (CLAY + SIL CMT, SL CALC, PY)
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF MULBRING SLTST, MUREE SST, AND BRANXTON FM

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -2257± Thickness:)421
Geologic Description: M-DK GY ARG SL CARB + CALC SANDY + PBLY SLTST, BUFF-LT BR GY, VF-VC, QZ-LI-WKE SILTY, SI + CLAY CMTD, PY, CALC SST, DK GY-BLK SILTY SH, BLK COAL

Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "CONJOLA FM" IN COMPLETION REPORT. FOSSIL FRAGMENTS (BRACHIOPODS, CRINIODS) COMMON IN SILTSTONE

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -2257* Thickness: >421
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CONJOLA SUB-GROUP

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:750 Base Elevation: -437 Thickness: 745
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1806 Base Elevation: -1493 Thickness: 1056
Geologic Description:
Reported Environment: MEDIUM + LOW ENERGY MARINE TO MARGINAL DEPOSITIONAL ENVIRONMENTS WITH COAL SWAMPS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THIS REPORTED ENVIRONMENT (+ THOSE THAT FOLLOW) IS A GENERALISED ONE

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:2167 Base Elevation: -1854 Thickness: 361
Geologic Description:
Reported Environment: LOW ENERGY MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:2182 Base Elevation: -1869 Thickness: 15
Geologic Description:
Reported Environment: MARGINAL DEPOSITIONAL ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:2409 Base Elevation: -2096 Thickness: 227
Geologic Description:
Reported Environment: MARGINAL DEPOSITIONAL ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:TD Base Elevation: -2257# Thickness:)161
Geologic Description:
Reported Environment: MARGINAL DEPOSITIONAL ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:TD Base Elevation: -2257# Thickness:)161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -2257# Thickness:)764
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: HOWES VALLEY DDH 1

REFERENCE # S42

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE	SI/56-1	32 52'31"S	150 48'37"E		+154	-875	1029	

REFERENCE: X1 STUNTZ, J., PATERSON, I., AND MENZIES, I.
D.H. HOWES VALLEY D.D.H. 1 BORE LOG (NO STRATIGRAPHIC INTERPRETATION)
GEOL. SURV. N.S.W. UNPUBLISHED BORE LOG Page Publn Year: 1970

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:657 Base Elevation: -503 Thickness: 657
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:742 Base Elevation: -588 Thickness: 85
Geologic Description: COAL SEAMS (COAL, CLST, MDST), M LT GY SST, PBL CGL (NEAR TOP), VF-F SST, DK GY MDST, CLAYSTONE, SLTST. MDST BIOTURBATED NEAR BASE
Reported Environment:
Interpreted Environment:

Geologic Features: Feature	Depth	Elevation	Thickness
COAL: SEAM 1	658	-504	1.2
COAL: SEAM 2	695	-541	3.3
COAL: SEAM 3	713	-559	2.4
COAL: SEAM 4	735	-581	4.0

Tectonic Structure:
Remarks

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:768 Base Elevation: -614 Thickness: 26
Geologic Description: COAL, BR-BLK CARB CLST, GY-BLK CARB MDST, VF-M GY SST & DK GY-BLK SLTST. CLST BIOTURB AT BASE. SOME MDST BIOTURB. PLT FOSS IN MDST. INTBDD-LAMD
Reported Environment:
Interpreted Environment:

Geologic Features: Feature	Depth	Elevation	Thickness
COAL: SEAM 5	743	-589	0.7
COAL: SEAM 6	761	-607	4.7

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JERRYS PLAINS Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:935 Base Elevation: -781 Thickness: 167
Geologic Description: COAL SEAMS (COAL, CLST, MDST, OCC CL PELLET SST) WITH INTBDD-LAMD SLTST, MDST, CLST, GEN VF-F SST (SOME M-GRANULE), TF. SOME BIOTURB. PLT FOSS
Reported Environment:
Interpreted Environment:

Geologic Features: Feature	Depth	Elevation	Thickness
COAL: SEAM 8	777	-623	2.7
COAL: SEAM 10	809	-655	4.8
COAL: SEAM 15	917	-763	4.5
COAL: SEAM 16	932	-778	5.5

Tectonic Structure:
Remarks OTHER, SMALLER SEAMS PRESENT. SEAM 16 IS POSSIBLE BAYSWATER SEAM EQUIV.

STRATIGRAPHY: JERRYS PLAINS SUB-GP. Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:935 Base Elevation: -781 Thickness: 193
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS DENMAN FM & UNDIFF JERRYS PLAINS SUB-GROUP

STRATIGRAPHY: ARCHERFIELD SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:948 Base Elevation: -794 Thickness: 13
Geologic Description: LT GY M SST & GY CLAYEY MDST. INTBDD & LAMD. BIOTURB IN LOWER HALF, WITH SMALL FAULTING PHENOMENA & X-BDG. PLANT REMAINS ON BDG. SID NEAR TOP
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULGA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:951 Base Elevation: -797 Thickness: 3
Geologic Description: M GY-BLK, PARTLY SILTY, CARB, FISSILE MDST. PELLETOID IN LOWER HALF. COAL LAMELLAE THROUGHOUT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF WITTINGHAM CM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1002 Base Elevation: -848 Thickness: 51
Geologic Description: COAL SEAMS (COAL, CLST, SOME TF, MDST), GEN M GR SST (SOME F, C-VC), CLST, MDST, TUFF. INTBDD-LAMD. SOME PLANT FOSSILS
Reported Environment:
Interpreted Environment:FRINGING MARSH & LEVEE, & DISTRIBUTARY MOUTH BAR NEAR BASE
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SEAM 17	956	-802	5.3
COAL: SEAM 18	962	-808	1.1
COAL: SEAM 19	969	-815	0.4

Tectonic Structure:
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:1002 Base Elevation: -848 Thickness: 260
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERRYS PLAINS SUB-GP, ARCHERFIELD SST, BULGA FM & UNDIFF WITTINGHAM CM

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:1002 Base Elevation: -848 Thickness: 345
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI & WITTINGHAM COAL MEASURES

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:TD Base Elevation: -875 # Thickness: >27
Geologic Description: LAMINITES (F SST & CLST, CLST & SLTST) & INTBDD-LAMD M SST & CLST. BIOTURBATED
Reported Environment:

Interpreted Environment: INTERDISTRIBUTARY BAY
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP BOUNDARY AT TOP OF HIGHEST CONTINUOUS SEDIMENTATION UNIT WITH WORM BURROWS

CONTROL POINT: IRONBARK BRUSH 2

REFERENCE # S37

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CO-OP. COLLIERY	DDH	SI/56-2	32 49'25"S	151 37'15"E		+18	-386	404	

REFERENCE: ENGEL, B.A.
NEWCASTLE, 1:250,[illegible] GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-2 Page Publn Year: 1966
Cross Reference: DAVID, T.W.E., 190[illegible], GEOL. SURV. N.S.W., MEM. 4(1)

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:4 Base Elevation: +14 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -386 # Thickness: >400
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL-DONALDSON'S SM	98	-88	3.4
COAL-TOMAGO THICK SM	121	-107	3.1
COAL-TOMAGO THIN SM	152	-134	1.3
COAL-L RATHLUBA SEAM	388	-370	2.5

Tectonic Structure:
Remarks COAL INFORMATION FROM DAVID, 1907. OTHER, THINNER COAL SEAMS THROUGHOUT, INCL ?UPPER SPLIT RATHLUBA SM AT 320 M (<1 M)

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -386 # Thickness: >400
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF TOMAGO COAL MEASURES

CONTROL POINT: JERRY PLAINS 1

REFERENCE # S14 Y1
REFERENCE # S14 Y2
REFERENCE # S14 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO EXPL & PROD	RDM, CORE + WIRELINE	SI/56-1	32 28'29"S	150 56'24"E	119	123	-1472	1595	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
GENTILE, D.J.
ESSO JERRY PLAINS NO. 1 SYDNEY BASIN, NEW SOUTH WALES FINAL SUBSIDY REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 69/2004.
Page Publn Year: 1969
Cross Reference:

REFERENCE: Y2
MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN-A REVIEW
BUREAU OF MINERAL RESOURCES, AUSTRALIA, BULLETIN 149
Page PL 3 Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code: X110
Basal Information: Depth to Base: 172 Base Elevation: -49 Thickness: >168
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code: X115
Basal Information: Depth to Base: 172 Base Elevation: -49 Thickness: >168
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code: X120
Basal Information: Depth to Base: 1001 Base Elevation: -878 Thickness: 361
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GRETA CM TOP AT -517 M.

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code: Y101
Basal Information: Depth to Base: 162 Base Elevation: -39 Thickness: 158
Geologic Description: INTBDD SH, COAL AND MINOR SLTST AND SS. COAL BRIGHT-DULL; SH IS LT-M GREY, SILTY-SANDY, IN PART CARB; SS IS POOR SORT QZ-LI WACKE, GLAUC, CALC.
Reported Environment: NON-MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	21	+132	3
COAL	67	+56	6

	COAL	88	+35	6
	COAL	143	-28	6

Tectonic Structure:
Remarks REFERRED TO AS TOMAGO CM IN REFERENCE REPORT. COAL ALSO AT 158 M (BASE),3 M THICK

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:162 Base Elevation: -39 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS WITTINGHAM CM (TOMAGO IN REFERENCE REPORT)

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:391 Base Elevation: -258 Thickness: 219
Geologic Description: SH GRADING TO ARGIL SLTST WITH MINOR SS INTBDS AND TUFFS. M-DK GREY, SLIGHTLY CARB SILTY SH; MARINE FOSS AND PY IN SLTST; LT-M GY QZ-LI WACKE SS
Reported Environment: . MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	292	-169	
TUFF	308	-185	
TUFF	366	-243	

Tectonic Structure:
Remarks INTERVAL 162-640 M DEPTH ASCRIBED TO MULBRING-BELFORD FMS IN WELL REPORT. BASE OF MULBRING AT ARGIL-AREN CHANGE ON LOG.

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:777 Base Elevation: -654 Thickness: 396
Geologic Description: SH AND SLTST AT TOP (BELFORD) GRADES TO PREDOM SS AND CGL BELOW (ELDERSLIE). BURROWS, LOAD CASTS, MARINE FOSS(TOP), X-BDG F UP GRADED BIC (BOT)
Reported Environment: MARINE AT TOP, NON-MARINE BELOW
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF, WH-YEL	495	-372	
COAL	704	-581	3
COAL	710	-587	3

Tectonic Structure:
Remarks INCLUDES LOWER 259 M OF MULBRING-BELFORD FMS (BELFORD FM) AND ALL OF ELDERSLIE FM OF WELL COMPLETION REPORT

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:777 Base Elevation: -654 Thickness: 615
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS MULBRING AND BRANXTON FMS.

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1001 Base Elevation: -878 Thickness: 224
Geologic Description: INTBDD COAL SS AND LESSER ARGIL SLTST, CARB SH, VOLC. SS IS LT GY-BUFF, QZ-LI WACKE, IN PART CGL, CARB, PY. VOLC IS DK GY-GY BLK, VESICULAR
Reported Environment: NON-MARINE TO MARGINAL MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	870	-747	6
COAL	957	-834	8
VOLCANICS	983	-860	15
COAL	989	-866	5

Tectonic Structure:
Remarks OTHER THINNNER COALS THROUGHOUT

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1104 Base Elevation: -981 Thickness: 163
Geologic Description: GREY QZ-LI WACKE GRADING T ARGIL SANDY SLTST AT BASE. TOP SS SHOWS MASSIVE, CYCLIC GRADED,AND X-BDG; BOTTOM IS HIGHLY BURROWED WITH MARINE FOSS.
Reported Environment: SHALLOW MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL-COALY SEDIMENTS	1024	-901	2
COAL-COALY SEDIMENTS	1079	-956	3

Tectonic Structure:
Remarks

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1537 Base Elevation: -1414 Thickness: 433
Geologic Description: PREDOM DK GY-GY BLK SH AND LESSER INTBDD SLTST. SH IS VARIABLY SILTY, CARB, PY, FOSSILIFERROUS. INTVAL OF MICRO-XLLINE DOLOMITE AND "CLAY-SLATE"
Reported Environment: MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
DOLOMITE-CLAY SLATE	1487	-1364	18

Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1472± Thickness: >58
Geologic Description: VOLCANICS. GREEN-GY GREEN, GEN APHANITIC, WITH DK GREEN PHENOCYRSTS IN A CLAYEY FELD GROUNDMASS. MINOR FELD LATHS. BECOMES RED-RUST RED DOWNWARD
Reported Environment: ALTERED INTERMEDIATE LAVA, PROBABLY ANDESITE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1472± Thickness: >594
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY, RUTHERFORD, AND ALL ANDALE FM

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:189 Base Elevation: -66 Thickness: 185
Geologic Description: SH, LT GY-GY, INTBDD WITH MOSTLY FINE, POORLY SORTED SS, AND COAL. SS IS VARIABLY LITHIC, FELD, QZOSE, CARB, ARGIL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:351 Base Elevation: -228 Thickness: 162
Geologic Description: SHALE, M-DK GREY, SLIGHTLY CARB, GRADING TO ARGIL SLTST, MINOR SS INTBDS. SLTST FOSSILIFEROUS IN PLACES, PYRITIC
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:640 Base Elevation: -517 Thickness: 29$
Geologic Description: INTBDD SS, SLTST, SH WHICH IS SANDIER IN UPPER HALF. SS IS POORLY SORTED, F-M GRAINED, CGL IN PLACES. BRACHS AND RARE BURROWS

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:640 Base Elevation: -517 Thickness: 451
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE AND BRAMXTON FM

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1081 Base Elevation: -878 Thickness: 361
Geologic Description: SS, VF GRAINED TO CGL, CARB, ARGIL, WITH INTBDD SANDY SLTST AND MINOR SH. SS, F-CGL, ARGIL, CARB, PY, INTBDD COAL. MINOR SLTST, CARB SH INTBDS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1184 Base Elevation: -981 Thickness: 103
Geologic Description: SS, F-C GRAINED, CGL IN PART, UNCONSOLIDATED, SLIGHTLY CALC, GRADING TO SANDY SLTST. BURROWS, FORAM, BRYOZOA TRACES. MASS GRADATIONAL BDS (TOP)
Reported Environment: POSSIBLY NON-MARINE IN TOP
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1537 Base Elevation: -1414 Thickness: 433
Geologic Description: SLTST, M-DK GY, CARB, ARGIL, GRADES TO SILTY SH. SH, DK GY-BLK, PY, OCCAS FOSS, MINOR SLTST INTBDS. DOLOMITE INTBDD WITH SH. SH, DK GY, CARB.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -1472± Thickness:)58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -1472± Thickness:)594
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY, RUTHERFORD, AND ALLANDALE FORMATIONS

CONTROL POINT: JERRYS PLAINS DDH 6

REFERENCE # S7

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-4	32 22'20"S	150 46'04"E	+248	+249	+76	173	

REFERENCE: HOLMES, G.G.
JERRYS PLAINS COAL DRILLING PROGRAMME BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF EIGHT BORES DRILLED BY THE NSW DEPARTMENT OF MINES DURING 1973
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/359 (MICROFICHE) Page Pubin Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:15 Base Elevation: +234 Thickness: 14
Geologic Description: SANDSTONE, QZ-LI, F-M GRAINED AND M-C AT BASE. LOW ANGLE XBDS, MDST INTBDS-LM, BIOTURB. BURROWS, CARB PARTINGS AND SPECKS. LT-GY, RD-RN AT TOP.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:15 Base Elevation: +234 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WATTS SST.

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:21 Base Elevation: +228 Thickness: 6
Geologic Description: INTBDD-LMD M-GY SILTSTONE AND LT-GY,F SANDSTONE. BIOTURB, BURROWS, IRON-RICH BNDS, CARB PARTINGS. DK-GY MUDSTONE WITH IRON-RICH BNDS AT BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +76 * Thickness: >158
Geologic Description: INTBDD-LMD SST SLTST MDST CLST LAMINITE AND COAL. SST F-M S'TIMES C GRAINED. CARB.COALY PARTINGS, BIOTURB, PLANT REMAINS, IRON-RICH ZONES.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SM 1	23	226	1.4
COAL, SM 2	52	197	4
COAL, SM 6	133	116	3
COAL, SM 7	153	96	3

Tectonic Structure:
Remarks DENMAN FM AT TOP

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +76 * Thickness: >173
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS WOLLOMBI AND WITTINGHAM CM.

CONTROL POINT: JERRYS PLAINS DDH 8

REFERENCE # S8

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Rot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-1	32 25'41"S	150 44'00"E	178	179	8	171	

REFERENCE: HOLMES, G.G.
JERRYS PLAINS COAL DRILLING PROGRAMME BASIC RESULTS, HISTORY AND BRIEF GEOLOGY OF EIGHT BORES DRILLED BY THE NSW DEPARTMENT OF MINES DURING 1973
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/359 (MICROFICHE) Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WATTS SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:82 Base Elevation: 97 Thickness: 22
Geologic Description: SANDSTONE. LT GREY, CARB PARTINGS. TOP M-C GRAINED, QZ-LI. BOTTOM M-F GRAINED, LI MDST LAM, LOW ANGLE XBDS.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: BASE OF WOLLOMBI CM

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:82 Base Elevation: +97 Thickness: 81
Geologic Description: INTBDD-LAMD MDST CLST SST AND COAL, MINOR SLTST AND IGNEOUS ROCK. CARB PARTING, PLANT FOSS, SID AND IRON-RICH ZONES. SST MOSTLY M-F GRAIN, QZ-LI
Reported Environment:
Interpreted Environment:

Geologic Features: Feature	Depth	Elevation	Thickness
COAL, SM 1 (+ CLST)	22	137	7
IGNEOUS ROCK (SM 3)	35	144	2
COAL, SM 3(INTRUDED)	40	139	5
COAL, SM 4	60	119	1

Tectonic Structure:
Remarks: WATTS SST AT BASE

STRATIGRAPHY: DENMAN FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:130 Base Elevation: +49 Thickness: 48
Geologic Description: INTBDD-LAMD MDST AND SST (LAMINITE) WITH LESSER SLTST AND CLST. VERY BIOTURB, WORM BURROWS, CARB SPECS-LAM, IRON-RICH AND SID ZONES.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: TOP OF WITTINGHAM CM

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +8 * Thickness: >170
Geologic Description: INTBDD-LAMD DK-GY MDST AND LT-GY SST, COAL, LESSER SLTS CLST IGNEOUS ROCK. CARB PART, PLANT REM, BIOTURB,SID AND IRON-RICH ZONES, TEAL
Reported Environment:
Interpreted Environment:

Geologic Features: Feature	Depth	Elevation	Thickness
COAL, SM 5	133	46	3
COAL, SM 6(INTRUDED)	170	9	6
IGNEOUS ROCK (SM 6)	168	11	1

Tectonic Structure:
Remarks: DENMAN FM AT TOP.. IGNEOUS ROCK RECORDED AS DOLERITE?

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: 8* Thickness: >251
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM CM

CONTROL POINT: JILLIBY CREEK DDH 1

REFERENCE # 553

Organisatior	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-5	33 07'51"S	151 21'27"E	52	52	-700	752	

REFERENCE: CRAWFORD, E.A.
THE COORANBONG-KULNURA COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/362 (MICROFICHE) Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: TUGGERAH FM Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:193 Base Elevation: -141 Thickness: 193
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks NARRABEEN GP

STRATIGRAPHY: MUNMORAH CGL Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:308 Base Elevation: -255 Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF NARRABEEN GP

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:308 Base Elevation: -255 Thickness: 308
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TUGGERAH FM AND MUNMORAH CGL

STRATIGRAPHY: WARATAH SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:357 Base Elevation: -303 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF NEWCASTLE CM

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:357 Base Elevation: -305 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WARATAH SST AT BASE. WALLARAH SM ABSENT AT TOP; INDICATES PROBABLE UNCONFORMITY WITH OVERLYING NARRABEEN GP

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:443 Base Elevation: -391 Thickness: 86

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:604 Base Elevation: -552 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOWER TOMAGO CM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:722 Base Elevation: -670 Thickness: 118
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:722 Base Elevation: -670 Thickness: 365
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UPPER TOMAGO CM, KULNURA MARINE TNG, LOWER TOMAGO CM.

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -700 * Thickness:)30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -700 * Thickness:)30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE

CONTROL POINT: KELGOOLA DDH 3

REFERENCE # S43 X1	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	NSW DEPT MINES	DDH	SI/56-1	32 54'15"S	150 18'45"E		+780	+374	406	

REFERENCE: X1

THIS REPORT (FROM GEOL. SURV. N.S.W. BORELOG CODING FORM)

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:198 Base Elevation: +590 Thickness: 198
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FARMERS CREEK FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:228 Base Elevation: +552 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: THE GAP SST Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:232 Base Elevation: +548 Thickness: 5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLERAWANG SUB-GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:232 Base Elevation: +548 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARMERS CREEK FM & THE GAP SST

STRATIGRAPHY: STATE MINE CREEK FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:252 Base Elevation: +528 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ANGUS PLACE SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:270 Base Elevation: +510 Thickness: 18

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BAAL BONE FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:304 Base Elevation: +476 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: IRONDALE COAL Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:307 Base Elevation: +473 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LONG SWAMP FM Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:379 Base Elevation: +401 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CHARBON SUB-GP Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:379 Base Elevation: +401 Thickness: 147
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS STATE MINE CREEK FM, ANGUS PLACE SST, BAAL BONE FM, IRONDALE COAL, LONG SWAMP FM

STRATIGRAPHY: LIDSDALE COAL Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:381 Base Elevation: +399 Thickness: 2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKMANS FLAT CGL Age: PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:389 Base Elevation: +391 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:397 Base Elevation: +383 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:X114
Basal Information: Depth to Base:403 Base Elevation: +377 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CULLEN BULLEN SUB-GP Age: PERMIAN Interpretation Code:X115
Basal Information: Depth to Base:403 Base Elevation: +377 Thickness: 24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS LIDSDALE COAL, BLACKMANS FLAT CGL, LITHGOW COAL, MARRANGAROO CGL

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:X116
Basal Information: Depth to Base:TD Base Elevation: +374 ± Thickness:)3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X117
Basal Information: Depth to Base:TD Base Elevation: +374 ± Thickness:)216
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WALLERAWANG, CHARBON, CULLEN BULLEN & NILE SUB-GROUPS

CONTROL POINT: KULNURA 1

REFERENCE # S50

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
KAMILAROI/A.O.G.	PDH + RDH	SI/56-5	33 12'54"S	151 11'50"E	+326	+327	-2146	2473	

REFERENCE: OZIMIC, S.
PETROLOGICAL STUDY OF (KAMILAROI A.O.G.) KULNURA NO. 1 WELL, SYDNEY BASIN, NEW SOUTH WALES
BUREAU OF MINERAL RESOURCES, GEOLOGY + GEOPHYSICS RECORD 1969/102 Page Publn Year: 1969

Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:823 Base Elevation: -496 Thickness: 822
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SANDSTONE (0-94 M) AND NARRABEEN GROUP (94-823 M)

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:982 Base Elevation: -655 Thickness: 159
Geologic Description: CALCAREOUS SUBGREYWACKE, CARBONACEOUS, SANDY, MICACEOUS, PYRITIC SILTSTONE, LT GREY SILICEOUS CLAYSTONE, + BITUMINOUS COAL. TRACE PLANT FRAGS.
Reported Environment: NEAR-SHORE OR BACKSWAMP ENVIRONMENT WITH POOR CURRENT ACTIVITY AND PARTLY REDUCING CONDITIONS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	832	-505	3
COAL INTERVAL	872	-545	19
COAL INTERVAL	946	-619	34
COAL	976	-649	2

Tectonic Structure:
Remarks

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1151 Base Elevation: -824 Thickness: 169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1305 Base Elevation: -978 Thickness: 154
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: LOWER TOMAGO CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1446 Base Elevation: -1119 Thickness: 141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks SEE TOMAGO CM

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1446 Base Elevation: -1119 Thickness: 464
Geologic Description: CALC SUBGWKE, SANDY, CARB, PY, CALC SLTST, ARKOSE, VOLCANIC CLAYSTONE: COAL SEAMS + LENSES, BASALT SILL. KULMURA MT - FORAMS, OSTRACOD FRAGMENTS
Reported Environment: BACKSWAMP, INTERSTITIAL ENVIRONMENT WITH REDUCING CONDITIONS. VOLCANIC ACTIVITY DURING DEPOSITION. KULNURA MARINE TONGUE - LAGOONAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1100	-773	54
BASALT SILL	1268	-941	9
KULNURA MARINE TNG	1305	-978	154
COAL INTERVAL	1405	-1078	32

Tectonic Structure:
Remarks

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1904 Base Elevation: -1577 Thickness: 458
Geologic Description: SANDY CARBONACEOUS SILTSTONE, THIN BEDS CLAYSTONE, COAL LAMINAE. SANDIER + MORE PYRITIC TOWARDS BASE. FORAMS T'OUT OSTRACODS IN TOP HALF
Reported Environment: LOW ENERGY MARINE. TOP HALF LAGOONAL, BOTTOM HALF A MIXTURE OF BACK-SWAMP + LAGOON
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: MUREE SANDSTONE Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1930 Base Elevation: -1603 Thickness: 26
Geologic Description: PEBBLY SUBGREYWACKE WITH CALCITE CEMENT. ABUNDANT FORAM TESTS, BRACHIOPOD SPINES + SKELETONS OF BRYOZOA
Reported Environment: HIGH ENERGY MARINE ENVIRONMENT. GRANITIC AND MINOR SEDIMENTARY PROVENANCES
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -2146± Thickness:)543
Geologic Description: PEBBLY GREYWACKE, POORLY SORTED PEBBLEY SURGREYWACKE, RICHLY FOSSILIFEROUS SILTSTONE, SANDY SILTSTONE. FORAMS, BRACHIOPODS, BRYOZOA
Reported Environment: LOW ENERGY NEAR-SHORE ENVIRONMENT AT TOP. MODERATE ENERGY MARINE IN MIDDLE. FLUVIATILE AT BASE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -2146± Thickness:)102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

CONTROL POINT: LAKE MUNMORAH 2

REFERENCE # S62

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-5	33 11'21"S	151 36'43"E		+6	-115	121	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:68 Base Elevation: -62 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -115 * Thickness: >53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LITTLE TABLE TOP

REFERENCE # S21

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNIV. NEWCASTLE	SECTION	SI/56-1	32 31'15"S	151 26'00"E		+230	+200		

REFERENCE: X1 SLEE, K.J.
THE GEOLOGY OF THE CRANKY CORNER BASIN, NEW SOUTH WALES
B.SC.(HONS.) THESIS, UNIVERSITY OF NEWCASTLE (UNPUBLISHED) Page SECTION B Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: Base Elevation: +200 Thickness: 139
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks OVERLAIN BY BRANXTON FM (SLEE'S BIG TABLE TOP FM) & UNDERLAIN BY DALWOOD GP. ELEVATION IS APPROXIMATE ONLY

CONTROL POINT: LOCHINVAR

REFERENCE # 530

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION	SI/56-1	32 43'30"S	151 25'20"E	90	90	-745	835	

REFERENCE: OSBORNE, G.D.
THE STRATIGRAPHY OF THE LOWER MARINE SERIES OF THE PERMIAN SYSTEM IN THE HUNTER RIVER VALLEY, NEW SOUTH WALES
PROCEEDINGS OF THE LINNEAN SOCIETY NEW SOUTH WALES 74 Page 203-223 Publn Year: 1949

Cross Reference: PACKHAM, G.H., 1969. THE GEOLOGY OF NEW SOUTH WALES. P 320

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: LOCHINVAR FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:835 Base Elevation: -745 Thickness: 835
Geologic Description: SH, MDST, SST, CGL, BASALT, AND TUFF. SEDIMENTS COARSEN DOWNWARDS MARINE AND PLANT FOSSILS, GLACIAL ERRATICS, GLENDONITES
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	46	44	31
GLENDONITE HORIZON	61	29	
BASALT AND TUFF	168	-78	31
BASALT	320	-230	67

Tectonic Structure: SECTION ON W FLANK-NOSE LOCHINVAR DOME
Remarks: CONSIDERED A COMPLETE SECTION. SEE DALWOOD GROUP FOR OTHER GEOLOGIC FEATURES THICKNESS ASSUMED TO BE TRUE

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:835 Base Elevation: -745 Thickness: 835
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASALT	509	-419	15
TUFF	622	-532	16
BASALT	668	-578	46
TUFF, PEBBLY	835	-745	15

Tectonic Structure:
Remarks: CONTAINS COMPLETE LOCHINVAR FM, SEE LOCHINVAR FM FOR OTHER GEOLOGIC FEATURES.

CONTROL POINT: LODER 1

REFERENCE # S26 Y1
REFERENCE # S26 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-1	32 38'07"S	151 08'00"E	+103	+108	-1955	2063	?

REFERENCE:

COMPOSITE WELL LOG AOG LODER NO. 1
UNPUBLISHED WELL LOGS, AUSTRALIAN OIL AND GAS CORP. LTD.
Cross Reference: NICHOLAS, EVELYN, 1968: BMR RECORD 1968/130 // CORE LAB. AUST.(NSW) LTD., 1963, CORE, MUD AND CUTTINGS ANALYSIS FOR AOG LODER NO. 1 WELL.

Page Publn Year: 1963

REFERENCE: X1

THIS REPORT
Cross Reference: NICHOLAS, E., 1968, BUR. MIN. RES. RECORD 1968/130 /// WAYNE, S.J., ET AL., 1974 , BUR. MIN. RES. BULLETIN 149

Page Publn Year:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: 689 Base Elevation: -581 Thickness: 684
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code: X102
Basal Information: Depth to Base: 689 Base Elevation: -581 Thickness: 664
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS BRANXTON FM

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code: X103
Basal Information: Depth to Base: 774 Base Elevation: -666 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code: X104
Basal Information: Depth to Base: 932 Base Elevation: -824 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code: X105
Basal Information: Depth to Base: 1183 Base Elevation: -1075 Thickness: 251
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1955# Thickness:)890
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1955# Thickness:)880
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY, RUTHERFORD & ALLANDALE FORMATIONS

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:688 Base Elevation: -580 Thickness: 683
Geologic Description: VF-M SUB-GWKE AND PROTOQUARTZITE WITH SLTST INTBDS. COALY AND PEL BANDS. MARINE FOSS, BIOTURB. CARB, PY, SID, DAWSONITE AND SILICA CEMENTS
Reported Environment: SHALLOW AND MARGINAL MARINE, REDUCING ENVIRONMENT, MODERATE CURRENTS.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOL DESCRIPTION AND ENVIRONMENT FROM NICHOLAS, 1968. EQUIVALENT TO EMR UNITS L1-3

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:688 Base Elevation: -580 Thickness: 683
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BRANXTON FM

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:786 Base Elevation: -678 Thickness: 98
Geologic Description: 5 THIN COAL SEAMS ASSOCIATED WITH CHERTY LITHIC SS AND CGL. SIDERITE CEMENT, PYRITE, CARBONACEOUS. SOME STEEP X-BDG IN CGL
Reported Environment: HIGH ENERGY FLUVIAL. COAL ALLOCHTHONOUS, LACKING UNDERCLAYS WITH PLANT STEMS OR ROOT REMAINS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	707	-599	6
COAL, 2 SMS	756	-648	6

Tectonic Structure:
Remarks DESCRIPTION AND ENVIRONMENT FROM NICHOLAS, 1968. NEARLY EQUIVALENT TO EMR UNIT L4 (688-744M).

STRATIGRAPHY: FARLEY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:932 Base Elevation: -824 Thickness: 146
Geologic Description: BOTTOM 30M(L6) VF-F FELD-LI SS INTBDD WITH SLTST; TOP IS LITH SS. CARB FRAG, SPARSE MARINE FOSS, BURROWS, BIOTURB. SID, SILICA, DOLO., DAWSONITE
Reported Environment: SHALLOW QUIET WATER, MOSTLY BRACKISH, PARTLY MARINE AT BOTTOM. DECREASING CURRENT ACTION UPWARDS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks DESCRIPTION AND ENVIRONMENT FROM NICHOLAS, 1968. EQUIVALENT TO BMR UNITS L5-6.

STRATIGRAPHY: RUTHERFORD FM Age: PERMIAN Interpretation Code:Y185
Basal Information: Depth to Base:1183 Base Elevation: -1075 Thickness: 251
Geologic Description: POORLY BDD, PY, CARB SLTST COARSENING UPWARD TO FINE SS WITH SLTS PARTINGS. SHELL FRAG, BURROWS, BIOTURBATION. CALCITE AND SIDERITE CEMENT
Reported Environment: NEAR SHORE, POSSIBLY TIDAL FLAT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DESCRIPTION AND ENVIRONMENT FROM NICHOLAS, 1968. EQUIVALENT TO BMR UNIT L7.

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1955* Thickness:)680
Geologic Description: INTERMEDIATE TO BASIC PYROCLASTICS AND FLOWS AND AN INTERVAL OF ALTERNATING PINK AND GREEN CONGLOMERATE
Reported Environment: ACTIVE VOLCANISM, OR PERIOD OF FLUVIAL DEPOSITION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	T'OUT		
VOLCANICS	T'OUT		
CONGLOMERATE	1445	-1337	46

Tectonic Structure:
Remarks DESCRIPTION AND ENVIRONMENT FROM NICHOLAS, 1968. EQUIVALENT TO BMR UNITS L8-18.

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -1955* Thickness:)680
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY, RUTHERFORD, ALLANDALE FORMATIONS

CONTROL POINT: LOWER PORTLAND 1

REFERENCE # S66

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 26'00"S	150 51'45"E	+18	? +18 ?	72 89	0	S4

REFERENCE: MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:142 Base Elevation: -124 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:825 Base Elevation: -807 Thickness: 683
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -807 # Thickness: >65
Geologic Description:
Reported Environment: MARGINAL DEPOSITIONAL ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MARTINDALE 1A

REFERENCE # S10 Y1
REFERENCE # S10 Y2
REFERENCE # S10 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-1	32 30'48"S	150 37'00"E	+198	+208	-981	1181	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
BOYD, B.R.
AUSTRALIAN OIL + GAS CORPORATION LTD, MARTINDALE NOS. 1 + 1A, SYDNEY BASIN - N.S.W., WELL COMPLETION REPORT
AUSTRALIAN OIL + GAS CORP. LTD UNPUBLISHED REPORT. BMR FILE 67/4243
Page Publn Year: 1967
Cross Reference: NICHOLAS, E., 1969, BUR. MIN. RES. RECORD 1969/62

REFERENCE: Y2
MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149
Page PLATE 3 Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code: X110
Basal Information: Depth to Base: 338 Base Elevation: -138 Thickness: 218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code: X120
Basal Information: Depth to Base: 648 Base Elevation: -448 Thickness: 310
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code: X125
Basal Information: Depth to Base: 648 Base Elevation: -448 Thickness: 528
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code: X130
Basal Information: Depth to Base: 1150 Base Elevation: -950 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GRETA CM TOP AT -833 M.

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:116 Base Elevation: +84 Thickness: 114
Geologic Description: LT GY F-M VOLC SUBGWKE, INTBDD SILTY CARB PY CLST, CALCITIC CARB F SUBGWKE, SHALE WITH PYRITIC COAL LAMINAE, + OLIVE-BLK BASIC VOLCANICS
Reported Environment: QUIET SHALLOW WATER, MARGINAL, PROBABLY FRESH WATER REDUCING CONDITIONS. (NICHOLAS, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
VOLCANICS	101	+99	58

Tectonic Structure:
Remarks CALLED "NEWCASTLE COAL MEASURES" IN COMPLETION REPORT. GEOLOGIC DESCRIPTION - NICHOLAS, 1969. EQUIV TO BMR UNITS M1-3

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:648 Base Elevation: -448 Thickness: 532
Geologic Description: COAL SMS, LT GY F-M + M-C VOLC SUBGWKE, CARB PY SLTST, CARB SH, SID CARB SLTST + CLST, WH CLST, PROTOQZITE, VOLC LI GWKE, INTERMED-BASIC VOLCS
Reported Environment: SHALLOW, MARGINAL, PROBABLY FRESH WATER, MAINLY REDUCING CONDITIONS (NICHOLAS, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	276	-76	121
COAL INTERVAL	447	-247	129
VOLCANIC	520	-320	15
COAL INTERVAL	631	-431	101

Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION FROM NICHOLAS, 1969. APPROX EQUIVALENT TO BMR UNITS M4-9. CALLED "TOMAGO CM" IN COMPLETION REPORT.

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:648 Base Elevation: -448 Thickness: 646
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS WOLLOMBI AND WITTINGHAM COAL MEASURES

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:831 Base Elevation: -631 Thickness: 183
Geologic Description: VF GR F PROTOQZITE GRADING TO SLTST + CONTAINING CARB MATERIAL, AND INTBDD CARBONACEOUS, SIDERITIC, PYRITIC SILTSTONE + CLAYSTONE. BRYOZOANS
Reported Environment: SHALLOW WATER, MARGINAL, MARINE ENVIRONMENT UNDER SOMEWHAT REDUCING CONDITIONS (NICHOLAS, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks PROTOQZITE-SLTST CONTAINS SID + DAWSONITE CMTS. GEOL DESCRIPTION - NICHOLAS, 1969. APPROX EQUIV TO BMR UNITS M10-13

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1044 Base Elevation: -844 Thickness: 213
Geologic Description: SUBGWKE + PROTOQZITE GRADING IN PARTS TO SLTST + CLST. CARB MATERIAL + COAL FRAGS DECREASE UPWARDS, BASE PBLY, SCATTERED PBLS T'OUT. SHELL FRAGS
Reported Environment: SHALLOW WATER, MARGINAL MARINE CONDITIONS PROBABLY WITH SOME GENTLE CURRENT ACTION (NICHOLAS, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks APPROX EQUIVALENT TO BMR UNIT M14

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1044 Base Elevation: -844 Thickness: 396
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1150 Base Elevation: -950 Thickness: 186
Geologic Description: SANDY PETROMICT CGL, THIN COAL SEAMS, SANDY CARB SLTST, M-VF SUBGWKE WITH SILTY CARB LAM, HARD PY BLK SH, + F PROTOQZITE WITH RARE BRYOZOA
Reported Environment: SHALLOW MARGINAL FRESH WATER ENVIRONMENT, WITH CURRENT ACTION AT BEGINNING + QUIET CONDITIONS AT END OF DEPOSITION (NICHOLAS, 1969)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1046	-846	1.5 CA
COAL INTERVAL	1095	-895	2S

Tertonic Structure:
Remarks: CALLED "MUSWELLBROOK CM" IN COMPLETION REPORT. GEOLOGIC DESCRIPTION - NICHOLAS, 1969. APPROX EQUIV TO BMR UNITS M15-17

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y188
Basal Information: Depth to Base:TD Base Elevation: -981 * Thickness:)31
Geologic Description: ALTERED INTERMEDIATE TO BASIC VOLCANIC WITH BANDS OF GREYISH-RED CLAY (NICHOLAS, 1969)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: APPROXIMATELY EQUIVALENT TO BMR UNIT M16

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y189
Basal Information: Depth to Base:TD Base Elevation: -981 * Thickness:)31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS ALLANDALE FORMATION

STRATIGRAPHY: WOLLOMBI CM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:312 Base Elevation: -114 Thickness: 298
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: WITTINGHAM CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:683 Base Elevation: -483 Thickness: 369
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:683 Base Elevation: -483 Thickness: 667
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:821 Base Elevation: -621 Thickness: 138
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y285
Basal Information: Depth to Base:1033 Base Elevation: -833 Thickness: 212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y286
Basal Information: Depth to Base:1033 Base Elevation: -833 Thickness: 350
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SILTSTONE + BRANXTON FORMATION

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y287
Basal Information: Depth to Base:1152 Base Elevation: -952 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y288
Basal Information: Depth to Base:TD Base Elevation: -931 ± Thickness: >29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MELLONG 1

REFERENCE # S46

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	PDH, WIRELINE	SI/56-5	33 00'25"S	150 41'36"E	+349	+350	-555	905	

REFERENCE: WRIGHT, A.J.
WELL COMPLETION REPORT, MELLONG NO. 1 WELL, SYDNEY BASIN, NEW SOUTH WALES
AUSTRALIAN OIL + GAS CORPORATION LTD UNPUBLISHED REPORT Page Publn Year: 1964

Cross Reference: MAYNE, S.J. ET AL., 1974, BMR BULLETIN 149 /// MAYNE, S.J., 1969, BMR RECORD 196 9/27

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:113 Base Elevation: +237 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:756 Base Elevation: -406 Thickness: 643
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -555 * Thickness: >149
Geologic Description: F WH POORLY SRTD SL CARB, CALC SST, GY-GN M SST, M-DK GY F GR SLTST, WH-GY SLTST, GY-BLK PARTLY CARB SH, BLK BRIGHT COAL, MINOR SANDY MDST
Reported Environment: DELTAIC, WITH COAL SWAMPS (MAYNE ET AL., 1974, 67)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THIS REPORTED ENVIRONMENT IS A GENERALISED ONE

CONTROL POINT: MILLFIELD 1

REFERENCE # 539

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-1	32 52'39"S	151 12'27"E		117	-243	360	

REFERENCE: Y1 MCINTOSH, J.L.
GEOLOGY OF THE PAXTON DISTRICT, NSW
BSC HONOURS THESIS, UNIVERSITY OF NEWCASTLE (UNPUBLISHED) Page Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: SINGLETON SUPER-GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -243* Thickness:)360
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks STRATIGRAPHY DESCRIBED AS "TOMAGO AND NEWCASTLE EQUIVALENTS". NO MARKED COAL SEAM DEVELOPMENT

CONTROL POINT: MORISSET 4

REFERENCE # 559

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 08'40"S	151 30'47"E		+11	-210	221	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:80 Base Elevation: -69 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -210 * Thickness: >141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MT. MURWIN 1

REFERENCE # S41 Y1
REFERENCE # S41 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	PDH, CORED	SI/56-1	32 50'45"S	150 55'20"E	+443	+444	-443	887	?

REFERENCE: Y1 STUNTZ, J., AND WRIGHT, A.J.
MT MURWIN NO. 1 BORE, WELL COMPLETION REPORT
AUSTRALIAN OIL AND GAS CORP, LTD UNPUBLISHED COMPANY REPORT(BMR 63/1000) Page Publn Year: 1963
Cross Reference:

REFERENCE: Y2 MAYNE, J.J.
PETROLOGICAL STUDY OF MT MURWIN (A.O.G.) NO. 1 WELL SYDNEY BASIN, NSW
BUREAU OF MINERAL RESOURCES, AUSTRALIA RECORD 1968/131 Page Publn Year: 1968
Cross Reference: MAYNE, S.J., ET AL., 1975, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:82 Base Elevation: +362 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:772 Base Elevation: -328 Thickness: 690
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -443 # Thickness:)115
Geologic Description: LT GY, F-M GRAINED, LITHIC, TIGHT SANDSTONES, WITH BLACK COAL SEAMS + THIN INTERBEDS OF CARBONACEOUS SILTSTONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: ON ANTICLINAL STRUCTURE PLUNGING NW
Remarks THIS VALUE OF THICKNESS USED FOR ISOPACH MAP.

STRATIGRAPHY: HAWKESBURY SST Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:104 Base Elevation: +340 Thickness: 103
Geologic Description: ORTHOQUARTZITE. VF-C,MOSTLY MEDIUM GRAINED, POKE QZ PEBBLES. GRAINS SUB -ANGULAR. LIMONITIC
Reported Environment: FLUVIAL TO SHALLOW MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR LITHOLOGIC UNIT M1

STRATIGRAPHY: NARRABEEN GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:777 Base Elevation: -333 Thickness: 673
Geologic Description: PROTOQUARTZITE INTBDD WITH F QZ GWKE, MINOR RED MDST AND COAL, CGL HORIZONS IN MIDDLE. GN CHERT LITHIC GRAINS IN SS. SIDERITE COMMON
Reported Environment: DELTAIC ENVIRONMENTS. FLUVIO-DELTAIC AT TOP, INTERDISTRIBUTARY BACK SWAMP TOWARDS BOTTOM (COAL AND MDST SEDIMENTATION)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL TRACE CUTTINGS	393	51	
	COAL THIN SEAM	734	-290	
Tectonic Structure:				
Remarks	EQUIVALENT TO BMR UNITS M2-5			

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code: Y203

Basal Information: Depth to Base: TD Base Elevation: -443 ± Thickness: >118

Geologic Description: INTBDD PROTOQUARTZITES, VF GRAINED QZ GREYWACKES, GY MDST, AND COAL. SIDERITIC

Reported Environment: DELTAIC LAGOONS AND COASTAL SWAMPS. COALS FORMED FROM DRIFT VEGETATION(LACK OF UNDERCLAY SEAT-EARTHS)

Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL, 2 THICK SEAMS	786	-342	9
	COAL	792	-348	2
Tectonic Structure:				
Remarks	EQUIVALENT TO BMR UNITS M6-8			

CONTROL POINT: MURRAYS RUN DDH 1

REFERENCE # S49

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORE + WIRELINE	SI/56-5	33 06'25"S	151 11'12"E	135	135	-690	825	

REFERENCE: CRAWFORD, E.A.
THE COORANBONG-KULNURA COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1973/362 (MICROFICHE) Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: TERRIGAL FM Age: TRIASSIC Interpretation Code:Yi01
Basal Information: Depth to Base:260 Base Elevation: -125 Thickness: 260
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BALD HILL CLST EQUIV	53	82	10

Tectonic Structure:
Remarks

STRATIGRAPHY: PATONGA CLST Age: TRIASSIC Interpretation Code:Yi02
Basal Information: Depth to Base:274 Base Elevation: -139 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE MAY BE 309M.

STRATIGRAPHY: TUGGERAH FM Age: TRIASSIC Interpretation Code:Yi03
Basal Information: Depth to Base:557 Base Elevation: -422 Thickness: 283
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MUNMORAH CGL Age: TRIASSIC Interpretation Code:Yi04
Basal Information: Depth to Base:758 Base Elevation: -623 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Yi05
Basal Information: Depth to Base:758 Base Elevation: -623 Thickness: 758
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TERRIGAL FM, PATONGA CLST, TUGGERAH FM, MUNMORAH CGL.

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Yi06

Basal Information: Depth to Base:TD Base Elevation: -690 ± Thickness: >47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	763	-628	5
COAL	789	-654	5
COAL	794	-659	3
COAL	810	-675	1

Tectonic Structure:
Remarks

CONTROL POINT: NEW MAIN COLLIERY

REFERENCE # S20

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
UNIV. NEWCASTLE	SECTION	SI/56-1	32 31'45"S	151 24'00"E		+160	+160		

REFERENCE: X1 SLEE, K.J.
THE GEOLOGY OF THE CRANKY CORNER BASIN, NEW SOUTH WALES
B.SC.(HONS.) THESIS, UNIVERSITY OF NEWCASTLE (UNPUBLISHED) Page SECTION C Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code: X101
Basal Information: Depth to Base: Base Elevation: +160 Thickness: 245
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks OVERLAIN BY BRANXTON FM (SLEE'S BIG TABLE TOP FM) & UNDERLAIN BY DALWOOD GP. ELEVATION IS APPROXIMATE ONLY

CONTROL POINT: SAVOY DDH #2

REFERENCE # S3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	DDH, EXTRAPOLATED	SI/56-1	32 20'15"S	150 57'30"E		+155	-247	402	

REFERENCE: X1 MOFFITT, R.S.
THE 1980 EAST MUSWELLBROOK COAL DRILLING PROGRAMME
GEOLOGICAL SURVEY OF NEW WOUTH WALES QUARTERLY NOTES, APRIL 1982 Page 17-26 Publn Year: 1982

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:211 Base Elevation: -56 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REFERENCE ELEVATION QUOTED ABOVE IS TAKEN FROM 1:250,000 TOPO. SHEET & IS APPROXIMATE

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:211 Base Elevation: -56 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BRANXTON FM

STRATIGRAPHY: ROWAN FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:367 Base Elevation: -212 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SKELETAR FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:382 Base Elevation: -227 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TD AT 371 M. THICKNESS OF SKELETAR FM FROM MOFFITT, 1982, P.18

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:382 Base Elevation: -227 Thickness: 171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROWAN FM & SKELETAR FM

STRATIGRAPHY: GYARRAN VOLCANICS Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -247 * Thickness:)20

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks .. THICKNESS ESTIMATED FROM FIG. 4 (MOFFITT, 1982)

STRATIGRAPHY: LALWOOD GP Age: PERMIAN Interpretation Code: X107
Basal Information: Depth to Base: TD Base Elevation: -247 * Thickness: >26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GYARRAN VOLCANICS

CONTROL POINT: SEDGEFIELD 1

REFERENCE # S18 Y1
REFERENCE # S18 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-1	32 30'55"S	151 15'08"E	+60	+60	-627	687	?

REFERENCE: Y1 BRADLEY, K.
A.O.G. SEDGEFIELD NO.1 COMPOSITE WELL LOG
UNPUBLISHED
Page Publn Year: 1964
Cross Reference:

REFERENCE: Y2 WAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149
Page 21 Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:449 Base Elevation: -389 Thickness: 449
Geologic Description: INTBDD GY-WH, VF-M, POORLY SRTD SILTY SST WITH QZ + ROCK FRAGS + FINE BANDING WITH CARB SH, PBLY SST-PBL CGL. + DK GY CARB SHALES + SILTSTONES
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	77	-17	4
COAL	251	-191	1 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:496 Base Elevation: -436 Thickness: 47
Geologic Description: COAL SEAMS INTERBEDDED WITH CONGLOMERATES AND MINOR SANDSTONES, SHALE AND SILTSTONE BANDS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	453	-393	3
COALY INTERVAL	474	-414	4 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: FARLEY-RUTHERFORD Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:552 Base Elevation: -492 Thickness: 56
Geologic Description: LT GY-WH FINE GRAINED SANDSTONE WITH QZ + ROCK FRAGMENTS, AND GY + DK GY CARBONACEOUS SHALES + SILTSTONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THIS UNIT IS A FARLEY + RUTHERFORD FORMATIONS EQUIVALENT

STRATIGRAPHY: ALLANDALE FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -627 ± Thickness:)135
Geologic Description: ANDESITE, DARK GREEN-BLACK BASALT AND TUFFACEOUS SANDSTONES. AMYGDALOIDAL
Reported Environment:
Interpretrd Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y105

Basal Information: Depth to Base:TD Base Elevation: -627 * Thickness:)191
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS FARLEY RUTHERFORD FORMATION EQUIVALENT AND ALLANDALE FORMATION

STRATIGRAPHY: NARRABEEN GP Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:46 Base Elevation: +14 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION IDENTITY IS A MISPRINT FOR MAITLAND GP.

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:495 Base Elevation: -435 Thickness: 449
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THESE FORMATION PICKS USED FOR STRUCTURE AND ISOPACH MAPS.

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:TD Base Elevation: -627 * Thickness:)192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SOUTH WALLARAH 5

REFERENCE # S60

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
JOINT COAL BOARD	DTH	SI/56-5	33 11'15"S	151 31'03"E	15	15	-499	515	

REFERENCE: Y1 BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
1:250,000 GEOLOGICAL SERIES EXPLANATORY NOTES SYDNEY SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES Page TABLE 3 Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:115 Base Elevation: -100 Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:TD Base Elevation: -499* Thickness: >401
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ST. HELIERS BMR 1

REFERENCE # S1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	DDH, CORE + WIRELINE	SI/56-1	32 15'00"S	150 56'30"E	181	181	-355	536	

REFERENCE: KONECKI, M.C.
DRILLING RESULTS RAVENSWORTH AND MUSWELLBROOK AREAS, NSW
BUREAU OF MINERAL RESOURCES, AUSTRALIA RECORD 1955/44 Page Publn Year: 1955
Cross Reference: REYNOLDS, M.A., 1956, BMR REPORT 28

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:5 Base Elevation: +176 Thickness: 5
Geologic Description: SAND AND PEBBLES. MARINE FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:14 Base Elevation: +167 Thickness: 9
Geologic Description: DOMINANTLY SILTSTONE WITH F-C GRAINED GWKE. CLAY AND IGNEOUS PEBBLES. MARINE FOSSILS
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:346 Base Elevation: -165 Thickness: 332
Geologic Description: VF-C GRAINED PEBBLY GREYWACKE AND SILTSTONE AND SOME CONGLOMERATE. ARGIL IN PART. MARINE FOSSILS
Reported Environment: MARINE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFFACEOUS SHALE	37	144	91
CONGLOMERATE	128	+53	3

Tectonic Structure:
Remarks: TOP OF BRANXTON IS LITOLOGICALLY SIMILAR TO MULBRING SLTST BUT CHOSEN ON BASIS OF MICROFAUNA.

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:346 Base Elevation: -165 Thickness: 346
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS MULBRING SILTSTONE AND BRANXTON FM.

STRATIGRAPHY: GRETA CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:527 Base Elevation: -346 Thickness: 148+
Geologic Description: VF-VC-PEBBLY GWKE, CGL, AND SH; NUM COAL SMS ; TUFFS AT BASE. MORE ARGIL AND TFAC TOWARDS BASE. CARB PARTINGS, PY, SLICKENSIDES, PLANT FOSSILS.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, FLEMING NO 1A	410	-229	12
COAL, HULLET NO 1B	427	-246	6
COAL, U MUSWELLBROOK	442	-261	13

	TUFF	5??	-348	12

Tectonic Structure: DIPS 15-40 DG. ON NW NOSE OF FAULTED SYN
Remarks: THICK CORRECTED; AVG 35 DG DIP. OTHER COAL AT 426M(13M) MUSWBROOK 1/ST HEL 2; 488M(4M) LEWIS 3; 510M(15) LODER 4 (DEPTH)

STRATIGRAPHY: GYARRAN VOLCANICS Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -355 ± Thickness:)9
Geologic Description: BRECCIATED AMYGDALOIDAL BASALT WITH CALCAREOUS MATRIX AND CALCITE VEINING FRAGMENTS OF SANDSTONE, CLAYSTONE AND COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: FAULTING AT UPPER BOUNDARY WITH GRETA CM
Remarks

CONTROL POINT: STOCKTON DDH 3

REFERENCE # S33

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MIN RES	DDH	SI/56-2	32 50'41"S	151 46'10"E	1	1	-734	735	

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MCMINN, A.
PRELIMINARY PALYNOSTRATIGRAPHY OF DM STOCKTON DDH 3
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS1981/409
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: ALLUVIUM Age: RECENT Interpretation Code: X110
Basal Information: Depth to Base: 51 Base Elevation: -50 Thickness: 51
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DEMPSEY FM Age: PERMIAN Interpretation Code: X115
Basal Information: Depth to Base: 330? Base Elevation: Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code: X120
Basal Information: Depth to Base: TD Base Elevation: -734± Thickness: >159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks KULNURA WITHIN THE TOMAGO CM

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code: X130
Basal Information: Depth to Base: TD Base Elevation: -734 ± Thickness: >735
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
DOLERITE SILL 525 -524 15
Tectonic Structure:
Remarks CONTAINS KULNURA MARINE TONGUE AND DEMPSEY FM

STRATIGRAPHY: DEMPSEY FM Age: PERMIAN Interpretation Code: Y110
Basal Information: Depth to Base: 400 Base Elevation: -399 Thickness: >350
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TENTATIVE INTERPRETATION; TD AND DEPTH OF ALLUVIUM OF A.T. BRAKEL (THIS REPORT) USED AS REQUIRED

STRATIGRAPHY: TOWASO CM Age: PERMIAN Interpretation Code:Y120
Basal Information: Depth to Base:600 Base Elevation: -599 Thickness:)550
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TENTATIVE INTERPRETATION

STRATIGRAPHY: KULBRING SLTST Age: PERMIAN Interpretation Code:Y130
Basal Information: Depth to Base:TD Base Elevation: -734 * Thickness:)160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TENTATIVE INTERPRETATION; WHERE REQUIRED FIGURES OF BRAKEL (THIS REPORT) ARE USED

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y140
Basal Information: Depth to Base:TD Base Elevation: -734 * Thickness:)160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TERRIGAL 1-1A

REFERENCE # 564

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CENT. COAST OIL	DDH, WIRELINE	SI/56-5	33 26'22"S	151 25'56"E		+5	-1881	1886	

REFERENCE: MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page Publn Year: 1974

Cross Reference: NIXON, W.H., 1970, UNPUBLISHED STRATIGRAPHIC LOG OF CENTRAL COAST OIL TERRIGAL N 0.1

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:582 Base Elevation: -577 Thickness: 502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:866 Base Elevation: -861 Thickness: 284
Geologic Description: M GR-CGL LT GY QZ LI SST (S'TIMES, CLAY + COAL PARTINGS), LT-M GY F GRAVEL CARB SST, PBL CGL, M-DK GY + BLK SILTY CLST, CARB SLTST, COAL SEAMS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	583	-578	0.8
COAL	609	-604	4.4
COAL	625	-620	2.6
COAL	685	-680	2.4

Tectonic Structure:
Remarks LITHOLOGIC DESCRIPTION FROM NIXON, 1970

STRATIGRAPHY: UPPER TOMAGO CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1256 Base Elevation: -1251 Thickness: 390
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1424 Base Elevation: -1419 Thickness: 168
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: LOWER TOMAGO CM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1798 Base Elevation: -1793 Thickness: 374
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks SEE TOMAGO CM

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1798 Base Elevation: -1793 Thickness: 932
Geologic Description: DK GY CARB MICAC CLST, LT GY F GRAVEL SST WITH SH LAM, COAL SEAMS, M GR-F GRAVEL LI SST, DK GY MICAC SANDY SLTST, MINOR TUFF. SHELL FRAGMENTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1228	-1223	75
KULMURA MARINE TNG	1424	-1419	168
COAL INTERVAL	1601	-1596	15

Tectonic Structure:
Remarks COAL SEAMS ARE THIN (0.4-1.0 M). LITHOLOGIC DESCRIPTION & COAL INFORMAT

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -1881* Thickness:)88
Geologic Description: DARK GREY, GREY, AND GREEN-GREY SILTSTONE AND CLAYSTONE. CARBONACEOUS IN PART, SANDY IN PART
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LITHOLOGIC DESCRIPTION FROM NIXON,1970

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y100
Basal Information: Depth to Base:TD Base Elevation: -1881* Thickness:)88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF MULBRING SLTST

CONTROL POINT : TORONTO

REFERENCE # 558

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION	S1/56-5	33 00'42"S	151 35'29"E	20	20			

REFERENCE: X1 ENGEL, B.A.
1:250,000 GEOLOGICAL SERIES EXPLANATORY NOTES NEWCASTLE SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES Page P 23 Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code: Y110
Basal Information: Depth to Base: Base Elevation: Thickness: >460
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks USED FOR NEWCASTLE ISOPACH

CONTROL POINT: UPPER COLO DDH 1

REFERENCE # S67 Y1
REFERENCE # S67 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	RDH + DDH, CORED	SI/56-5	33 25'21"S	150 44'11"E		+15	-946	961	?

REFERENCE: STUNTZ, J., LISHMUND, S., AND MENZIES, I.
D.H. UPPER COLO D.D.H.1 (R.D.H AND D.D.H.) BORE LOG
N.S.W. MINES DEPARTMENT FILE M60/9247
Page Publn Year: 1976
Cross Reference:

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:681 Base Elevation: -666 Thickness: 681
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:846 Base Elevation: -831 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -946 * Thickness: >116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:681 Base Elevation: -666 Thickness: 681
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -946 * Thickness: >280
Geologic Description: COAL, VF-F LT-M + DK GY, F-M M-LT GY, M-VC LT GY LI+QZ LI SSTS, GY + BLK-BR CARB CLSTS, LT-DK GY + BR CARB SLTSTS, BR+GY MDSTS, WH, GL, BR TUFFS
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SEAM 4	729	-714	3.4
TUFF: F, WH, HARD	744	-729	5.2
COAL: SEAM 6	753	-738	3.8
TUFF: LT GY-OLIVE, F	811	-796	7.5

Tectonic Structure:

Remarks: SED STRUCTS: LAMN, CONTORTED BDG, SLUMPING, MUD CRACKS, WORM BURROWS, PLANT REMAINS. COAL + TUFF BANDS THROUGHOUT

CONTROL POINT: WINDEYERS HAWKES. R

REFERENCE # S83

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-5	33 33'17"S	151 15'04"E		+3	-913	916	

REFERENCE: ; BRYAN, J.H., MCELROY, C.T., AND ROSE, G. (FULL NAME - WINDEYER'S HAWKESBURY RIVER BORE)
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: Y101
Basal Information: Depth to Base: 708 Base Elevation: -705 Thickness: 708
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base: TD Base Elevation: -913 # Thickness:)208
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WYEE BORE

REFERENCE # S61

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	BORE	SI/56-5	33 12'10"S	151 29'26"E		+12	-277	289	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, NORTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: Y101
Basal Information: Depth to Base: 114 Base Elevation: -102 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base: TD Base Elevation: -277 + Thickness: >175
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

SYDNEY

BASIN

CENTRAL

CONTROL POINT: BALMAIN SHAFTS, BORE

REFERENCE # 586

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
OIL SEARCH LTD	MINE SHAFTS + ?RDH	SI/56-5	33 51'05"S	151 10'51"E	+9	+9	-1495	1504	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, C.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149.
AUST. J. SCI. (1941) V.3 P.102-103.

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:878 Base Elevation: -869 Thickness: 878
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST (0-2(4 M) + NARRABEEN GROUP

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1385 Base Elevation: -1376 Thickness: 507
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCERTAIN IF BASE IS TRUE BASE OR TOP OF KULNURA MT

STRATIGRAPHY: SHOALHAVEN GP EQUIV Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base TD Base Elevation: -1495# Thickness: >119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THIS COULD BE KULNURA MT, WHICH IS 168M THICK IN TERRIGAL 1

CONTROL POINT: BERKSHIRE PARK 1

REFERENCE # 580

Organisation	Type	Kapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 46'53"S	150 47'27"E	+50 ?	+50 ?	-1042	1092	

REFERENCE: MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: WIANAMATTA GROUP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:122 Base Elevation: -72 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:323 Base Elevation: -273 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1025 Base Elevation: -975 Thickness: 732
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -1042* Thickness:)67
Geologic Description:
Reported Environment: DELTAIC (P.67)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CAMDEN 8

REFERENCE # S78

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Dat El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 52'56"S	150 44'15"E		+60	-581	641	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966
Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: WIANAMATTA GROUP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:87 Base Elevation: -27 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:299 Base Elevation: -239 Thickness: 212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -581 * Thickness: >342
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CAPE BANKS DDH 1

REFERENCE # S88

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-5	33 59'26"S	151 15'05"E		+21	-1110	1131	

REFERENCE: MENZIES, I., AND STUNTZ, J.
D.H. CAPE BANKS D.D.H. 1
N.S.W. MINES DEPARTMENT FILE M68/9247 Page Publn Year: 1971

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:684 Base Elevation: -663 Thickness: 684
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST AND NARRABEEN GROUP

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:686 Base Elevation: -665 Thickness: 2
Geologic Description: COAL, LAMINATED CARBONACEOUS MUDSTONE, BROWN CARBONATE, DK GREY-BLACK CARBONACEOUS CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM 1	686	-665	2

Tectonic Structure:
Remarks

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:792 Base Elevation: -771 Thickness: 106
Geologic Description: DK BR-GY CARB + DK GY-BLK SLTSTS, DK BR, M-DK GY +BLK MDSTS, F-M LT GY QZ LI, F LT BR-GY CARB, VF + VC SSTS, DK GY-BLK CARB CLST, COAL, SYENITE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM 2	695	-677	1
SYENITE	761	-740	34
COAL INTERVAL SM 3+4	770	-749	8.2
COAL SEAM 5	785	-764	3.7

Tectonic Structure:
Remarks 2.1 M OF SYENITE OCCURS AT -700 M (721 M DEPTH)

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:808 Base Elevation: -787 Thickness: 16
Geologic Description: M-DK GY SILTY SL CARB + DK BR-BLK CARB MDSTS, COAL, M-DK GY SLTST, F GY-LT BR MICAC, F-M + VF-F CARB SSTS, BR TFAC CLST, OOLITIC SID; PLT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM 6	803	-782	1.8
COAL SEAM 7	808	-787	1.2

Tectonic Structure:
Remarks

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:862 Base Elevation: -841 Thickness: 54
Geologic Description: M-DK GY + DK BR-GY CARB MDSTS, VF, F LT GY + M-C SSTS, F-M LT GY QZ LI SST WITH CARB LAM, PBL-GRANULE CGL, BLK CARB CLST, GY SLTST, MINOR COAL
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:880 Base Elevation: -859 Thickness: 18
Geologic Description: COAL, TFAC BR + DK GY-BLK CARB CLSTS, TFAC + DK BR-BLK CARB MDSTS, VF BR-GY (WITH CARB LAM), VF LT GY CHERTY TFAC + F-M LT GY QZ LI SSTS, SLTSTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAM 8 873 -852 10.7
Tectonic Structure:
Remarks CONTAINS PLANT IMPRESSIONS

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:910 Base Elevation: -889 Thickness: 38
Geologic Description: M-DK GY + LT GY SLTSTS, DK GY MDST, VF LT GY SST WITH CARB + MDST LAM, M LT BR-GY SST WITH CARB LAM, F-M LT GY QZ LI SST, MINOR TFAC CLST; LAMN
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:931 Base Elevation: -910 Thickness: 21
Geologic Description: DK GY-BLK MDST WITH F-M LT GY SST LAM. LAMINATED IN PARTS, OTHERWISE MASSIVE. BUFF TFAC CLST, CARBONATE REPLACEMENT. MDST CARB TOWARDS BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:942 Base Elevation: -921 Thickness: 11
Geologic Description: COAL, BLK CARB MDST S'TIMES WITH SST LAM, BR TFAC CLST, DK BR-BLK MDST (CARB IN PARTS), VF LT BR-GY SST WITH CARB MDST + CLST LAM
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAM 9 939 -918 1.2
COAL SEAM 10 942 -921 1.8
Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:980 Base Elevation: -959 Thickness: 38
Geologic Description: M-DK GY SILTY SANDY (WITH CARB PARTINGS) + DK GY-BLK (WITH SST LAM) MDSTS, VF-F GY (WITH CARB MDST LAM),+ M-C GY QZ LI (WITH MDST LAM) SSTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO CONTAINS F-M + M LT GY QZ LI SSTS + BUFF TFAC CLST

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:980 Base Elevation: -959 Thickness: 276
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS ALL OF THE ABOVE PERMIAN FORMATIONS

STRATIGRAPHY: ERINS VALE FM Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1110± Thickness: >151
Geologic Description: VF, F, M, C + GRANULE GY LI SSTS, F-M + M-GRANULE LT GY QZ LI SSTS, LT BR-GY SST, DK GY SL CARB + DK GY-BLK CARB MDSTS, COAL, M-DK GY SLTST.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INT. SMS 12+13	1027	-1086	5.2
COAL SEAM 14	1032	-1011	1.8
COAL INT. SMS 15+16	1039	-1018	4.3
KULNURA MAR. TONGUE	TD		>38

Tectonic Structure:
Remarks ALSO CONTAINS BLK CARB CLST, BUFF CHERTY TFAC CLST + PLANT FOSSILS

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -1110± Thickness: >38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks BASE OF ERINS VALE FM

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:TD Base Elevation: -1110± Thickness: >151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONSISTS OF ERINS VALE FM; KULNURA MARINE TNG AT BASE

STRATIGRAPHY: ILLAWARRA GM Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:TD Base Elevation: -1110± Thickness: >447
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONSISTS OF SYDNEY AND CUMBERLAND SUB-GP

CONTROL POINT: DURAL SOUTH 1

REFERENCE # S82 Y1
REFERENCE # S82 Y2
REFERENCE # S82 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Pef El	Bot El	T.Dpth	status code
SHELL DEV. AUST.	RDH, CORE + WIRELINE	SI/56-5	33 42'37"S	151 01'02"E	+194	+198	-2861	3059	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
HAWKINS, P.J., AND OZIMIC, S.
PETROLOGICAL STUDY OF DURAL SOUTH (SHELL) NO.1 WELL, SYDNEY BASIN, NEW SOUTH WALES
BUREAU OF MINERAL RESOURCES, GEOLOGY + GEOPHYSICS RECORD NO. 1967/160 Page CO. INTERP Publn Year: 1967
Cross Reference:

REFERENCE: Y2
MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page PLATE 2 Publn Year: 1974
Cross Reference: HAWKINS, P.J. AND OZIMIC, S., 1967, BUR. MIN. RES. RECORD 1967/160

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: X101
Basal Information: Depth to Base: 832 Base Elevation: -634 Thickness: 828
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code: X102
Basal Information: Depth to Base: 1024 Base Elevation: -826 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code: X103
Basal Information: Depth to Base: 1359 Base Elevation: -1161 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code: X104
Basal Information: Depth to Base: 1614 Base Elevation: -1416 Thickness: 590
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2353 Base Elevation: -2155 Thickness: 739
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3045 Base Elevation: -2847 Thickness: 692
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3045 Base Elevation: -2847 Thickness: 1332
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MULBRING SLTST & BRANXTON FM

STRATIGRAPHY: UNNAMED TUFF Age: NOT SPECIFIED Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2861* Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:832 Base Elevation: -634 Thickness: 828
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST (0-274 M) + NARRABEEN GP (274-832 M). THE FOLLOWING INTERPRETATION IS THE COMPANY'S (ADG)

STRATIGRAPHY: NEWCASTLE CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:985 Base Elevation: -787 Thickness: 153
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1614 Base Elevation: -1416 Thickness: 629
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MULBRING SLTST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:2415 Base Elevation: -2217 Thickness: 801
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BRANXTON FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:3050 Base Elevation: -2852 Thickness: 635
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MAITLAND GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:3050 Base Elevation: -2852 Thickness: 1436
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF MULBRING SILTSTONE AND BRANXTON FORMATION

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -2861± Thickness:)9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ECONOMIC BASEMENT

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:832 Base Elevation: -634 Thickness: 828
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF WIANAMATTA GP (0-37 M), HAWKESBURY SST (37-241 M), AND NARRABEEN GP (241-832 M). EQUIV TO BMR UNITS D1-7

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1713 Base Elevation: -1515 Thickness: 881
Geologic Description: COAL SEAMS, F-C SUBGWKE, AT TIMES THICKLY BDD SANDY SLTST, RARE CLST. SCOUR + FILL STRUCTURES, BURROWS, LAMNS, SMALL SCALE XBDG.
Reported Environment: TIDAL FLAT, SHALLOW MARINE WITH RESTRICTED WATER CIRCULATION, AND SHALLOW DELTAIC ENVIRONMENTS (HAWKINS AND OZIMIC, 1967)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - HAWKINS + OZIMIC, 1967. EQUIV TO BMR UNITS D8-14

STRATIGRAPHY: PERRY SILTSTONE Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:2152 Base Elevation: -1954 Thickness: 439

Geologic Description: SANDY SLTST WITH CHL CLAY + CARB MATTER AND MINOR F SUBGWKE, AND MASS QZ-RICH SANDY PY CARB SLTST WITH CLAY INTBDS + RARE QZ CGWE.
Reported Environment: QUIET SHALLOW MARINE ENVIRONMENT WITH SOME RESTRICTED WATER CIRCULATION. (HAWKINS + OZIMIC, 1967)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - HAWKINS + OZIMIC, 1967. SED STRUCTURES - CLAY LAMINATION, BURROWS + SMALL SCALE XRDG. =BMR D15-16

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:2181 Base Elevation: -1983 Thickness: 29
Geologic Description: MASSIVE, M GRAINED, POORLY SORTED PROTOQUARTZITE CONTAINING PEBBLES (HAWKINS + OZIMIC, 1967)
Reported Environment: DEPOSITION IN AGITATED WATER (HAWKINS + OZIMIC, 1967)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNIT D17

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:2353 Base Elevation: -2155 Thickness: 172
Geologic Description: SANDY, QUARTZ (50-65%) SILTSTONE WITH A POORLY SORTED QUARTZ GREYWACKE AT THE BASE. SOLITARY CORALS + RARE BRACHIOPODS (HAWKINS + OZIMIC, 1967)
Reported Environment: QUIET SHALLOW MARINE ENVIRONMENT. GREYWACKE - RAPID DEPOSITION UNDER LOW ENERGY CONDITIONS (HAWKINS + OZIMIC, 1967)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNIT D18

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:2757 Base Elevation: -2559 Thickness: 404
Geologic Description: PREDOM SST SEQ. M GR PROTOQUZITE, POORLY SRTD, QZ-RICH (80%) SUBARKOSE, + SLTST WITH CHL + ILL CLAY + DISSEM PY, WITH INTBDD QZ-RICH SST. FORAMS
Reported Environment: SHALLOW MARINE NEAR-SHORE ENVIRONMENT (HAWKINS + OZIMIC, 1967)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - HAWKINS + OZIMIC, 1967. EQUIV TO BMR UNITS D19-21

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:3045 Base Elevation: -2847 Thickness: 288
Geologic Description: ERYOZOAL MUDSTONE, QZOSE (60%) SLTST, SANDY LIMESTONE, M GR PROTOQUARTZITE, + MUDSTONE CONTAINING 65% ILLITIC CLAY (HAWKINS + OZIMIC, 1967)
Reported Environment: SHALLOW MARINE ENVIRONMENT WHERE OPEN SEA CONDITIONS EXISTED (HAWKINS + OZIMIC, 1967)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNITS D22-24

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:3045 Base Elevation: -2847 Thickness: 692
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SNAPPER POINT + PEBBLEY BEACH FORMATIONS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:3045 Base Elevation: -2847 Thickness: 1332
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BERRY SLTST, NOWRA SST, WANDRAWANDIAN SLTST, + CONJOLA SUB-GROUP

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code: Y210

Basal Information: Depth to Base: TD Base Elevation: -2861' Thickness:)14

Geologic Description: WEATHERED TUFF WITH REDDISH-BROWN SIDERITIC CRYSTALS. (HAWKINS + OZIMIC, 1967)

Reported Environment: DEPOSITION MAY HAVE TAKEN PLACE IN WATER OUTSIDE THE SPHERE OF TERRIGENOUS INFLUENCE. FROM ACID-INTERMEDIATE VOLCANO (HAWKINS + OZIMIC, 1967)

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks EQUIVALENT TO BMK UNIT D25

CONTROL POINT FAIRFIELD 1

REFERENCE # 587

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 52'16"S	150 54'54"E		+22	-832	854	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966
Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: WIANAMATTA GROUP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:73 Base Elevation: -51 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:311 Base Elevation: -289 Thickness: 238
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -832 * Thickness:)543
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KENTHURST 1

REFERENCE # 591

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 40'09"S	150 59'12"E		+104	-962	1066	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966
Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:855 Base Elevation: -751 Thickness: 855
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST (0-258 M) AND NARRABEEN GROUP (258-855 M)

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -962 * Thickness: >211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LEEHOME 1

REFERENCE # S79

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL	SI/56-5	33 48'59"S	150 44'45"E		+47	-617	664	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966
Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: WIANAMATTA GROUP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:97 Base Elevation: -50 Thickness: 97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:304 Base Elevation: -257 Thickness: 207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -617 * Thickness: >360
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LIVERPOOL—MOOREBANK

REFERENCE # S89

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	BORE	SI/56-5	33 58'55"S	150 54'45"E		+12	-781	793	

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: Y101
Basal Information: Depth to Base:760 Base Elevation: -748 Thickness: 760
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base TD Base Elevation: -781 + Thickness:)33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	760	-748	0.4
COAL	768	-756	0.4
COAL	788	-776	2

Tectonic Structure:
Remarks

CONTROL POINT: MULGOA 2

REFERENCE # S77

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE	SI/56-5	33 48'40"S	150 38'27"E	+151	+153	-1565	1716	

REFERENCE: MCGARRY, D.J.
WELL COMPLETION REPORT MULGOA NO. 2 WELL, SYDNEY BASIN, N.S.W.
AUSTRALIAN OIL + GAS CORPORATION LTD. UNPUBL. REPT. BMR FILE 62/102:1 Page Publn Year: 1960

Cross Reference: BMR, 1965, PET. SEARCH SUB. ACTS PUBL. 12 // MAYNE, S.J., ET AL., 1974, BUR. MIN . RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:761 Base Elevation: -610 Thickness: 759
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1096 Base Elevation: -945 Thickness: 335
Geologic Description: COAL SEAMS, GY SH, MLK CARB SH, M-DK GY COALY SH, LT GY TFAC SH, M-LT GY F-M LI SST, GY SLTST, + BASAL MASSIVE SILICEOUS C GRAINED GY SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL:WATOOMBA SM (?)	764	-613	2.4
COAL:MIDDLE R SM (?)	789	-638	4
COAL:IRONDALE SM (?)	838	-687	2
COAL:LITHGOW SM (?)	867	-716	4

Tectonic Structure: GENERALLY LOW DIP
Remarks 1 METRE COAL SEAMS AT -826 (977 M DEPTH) AND -935 (1086 M DEPTH). EQUIV TO LITHGOW CM + UNNAMED COAL MEASURES OF WCR

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -1565* Thickness: >620
Geologic Description: PARTLY CALC GY SLTST, DK GY PARTLY CARB SH, F-M GY LI SST WITH CALC CEMENT, M-C CGL GY SST + MINOR LST. PEBBLY IN LOWER 1/2. MARINE FOSSILS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
KEDUMBA SANDSTONE	1531	-1380	28

Tectonic Structure: GENERALLY LOW DIP
Remarks

CONTROL POINT: NARRABEEN

REFERENCE # 584

Organisation	Type	Mapno	Lat		Surf El	Ref El	Bot El	T.Dpth	status code
J. COGHLAN	BORE	SI/56-5	33 42'49"S	151	+2	+2	-603	605	

REFERENCE: SMITH, J.W., KOELMEY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF NEW SOUTH WALES EXPLANATORY NOTES SA/56-5 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, CENTRAL

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:121 Base Elevation: -119 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -603 # Thickness:)484
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

SYDNEY

BASIN

WEST

CONTROL POINT : BEDFORD CREEK BORE

REFERENCE # 576 Y1
REFERENCE # 576 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	BORE	SI/56-5	33 47'29"S	150 28'11"E		+373	-84	457	?

REFERENCE: Y1 BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966
Cross Reference:

REFERENCE: Y2 GOLDBERY, R.
GEOLOGY OF THE WESTERN BLUE MOUNTAINS
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO.20 Page 148 Publn Year: 1969
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:226 Base Elevation: +147 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:414 Base Elevation: -41 Thickness: 188
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -84 # Thickness:)43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -84 # Thickness:)231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY + CUMBERLAND SUB-GROUPS. ILLAWARRA CM ABOVE +104 M FORMS PART OF NEWCASTLE CM EQUIVALENT.

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:226 Base Elevation: +147 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF GROSE SANDSTONE (0-179 M) AND CALEY FM (179-226 M)

STRATIGRAPHY: UNDIFF ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:295 Base Elevation: +78 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL:KATOOMBA SEAM	227	+146	1.4
COAL:WOODFORD SEAM	239	+134	2
COAL:MIDDLE RIVER SM	269	+104	17
COAL:UNCORRELATED SM	295	+79	0.4

Tectonic Structure:
Remarks

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:410 Base Elevation: -37 Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WILE SUB-GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:TD Base Elevation: -84 * Thickness: >47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:TD Base Elevation: -84 * Thickness: >231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED ILLAWARRA CM, MARRANGAROO CONGLOMERATE, AND WILE SUB-GROUP

CONTROL POINT : BIRDS ROCK 22

REFERENCE # 559

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ELECOM	DDH	SI/56-5	33 23'15"S	150 16'59"E	1020	1020	594	426	

REFERENCE: X1

THIS REPORT

Page: Publn Year:

Cross Reference: WRITTEN COMMUNICATION FROM C.E. CRAPP (ELECOM)

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:284 Base Elevation: 736 Thickness: 284
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ANGUS PLACE SST Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:333 Base Elevation: 687 Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ILLAWARRA GM

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:417 Base Elevation: 603 Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ILLAWARRA GM

STRATIGRAPHY: ILLAWARRA GM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: 594* Thickness:)142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, LITHGOW SM 417 603 ?
Tectonic Structure:
Remarks CONTAINS ANGUS PLACE SST AND LITHGOW SM

CONTROL POINT: BROWNS GAP

REFERENCE # 571

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	SECTION	SI/56-5	33 30'00"S	150 10'00"E	+1010	+1010	+904	106	

REFERENCE: BRADLEY, G.
NOTES ON THE STRATIGRAPHY OF THE ILLAWARRA COAL MEASURES IN THE WESTERN COALFIELDS
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT NO. GS1980/180 Page Publn Year: 1980

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: FARMERS CREEK FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:18 Base Elevation: +992 Thickness: 18
Geologic Description: INTBDD THIN-THICK COALS, LAMINATED CARBONACEOUS-PARTLY CARBONACEOUS CLAYSTONE, MUDSTONE + SILTSTONE, + LESSER FINE GRAINED SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
?KATOOMBA COAL MB	2 CA	+1038	2 CA
MIDDLE RIVER COAL MB	14 CA	+996	9 CA

Tectonic Structure:
Remarks: OVERLAIN BY CALEY FORMATION OF NARRABEEN GROUP (TRIASSIC). NB. REFERENCE ELEVATION QUOTED ABOVE IS APPROXIMATE

STRATIGRAPHY: THE GAP SST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:24 Base Elevation: +986 Thickness: 6
Geologic Description: UPWARDS-FINING MEDIUM-COARSE GRAINED QUARTZ-LITHIC-FELDSPATHIC SANDSTONE WITH HIGH-ANGLE CROSS-BEDDING
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLERAWANG SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:24 Base Elevation: +986 Thickness: 24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS FARMERS CK FM + THE GAP SST

STRATIGRAPHY: STATE MINE CREEK FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:28 Base Elevation: +982 Thickness: 4
Geologic Description: VERY VARIABLE UNIT CONSISTING OF LAMINATED MUDSTONE AND THIN COAL LAYERS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
MCOLARBEN COAL MB	28	+982	4 ?

Tectonic Structure:
Remarks

STRATIGRAPHY: BAAL BONE FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:53 Base Elevation: +957 Thickness: 25
Geologic Description: DK-LT GY LAMD-MASS BIOTURB MDST + CLST, COMMONLY WITH NARROW WH TFAC CLST BANDS. SPORADIC F QZ-LI SST LAYERS, PBL BNDS, DK GY SID IRONST LENSES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GLEN DAVIS FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:65 Base Elevation: +945 Thickness: 12
Geologic Description: LAMD DK GY MDST + SLTST, NARROW COAL LAYERS + LOCALLY DEVELOPED OIL SHALE, WITH MORE BLOCKY MASSIVE CLAYSTONE + SILTSTONE TOWARDS THE BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NEWNES FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:70 Base Elevation: +940 Thickness: 5
Geologic Description: LAMINATED MDSTS, SLTSTS, MINOR NARROW COAL LAYERS, WITH A PERSISTENT DOWNWARDS-FINING F-M GR LITHIC SANDSTONE AT THE TOP
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: IRONDALE COAL Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:72 Base Elevation: +938 Thickness: 2
Geologic Description: COAL + CARB SILTSTONES + SHALES + IN SOME CASES SANDSTONES. NARROW CLAYSTONE BANDS. VERTEBRARIA IN BASAL COAL PENETRATE BUNNYONG SST MB BELOW
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LONG SWAMP FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:84 Base Elevation: +926 Thickness: 12
Geologic Description: DK GY LAMD BIOTURB MDST + CLST WITH THIN LOCALLY DEVELOPED DOWNWARDS-FINING F QZ-LI SSTS. THICKER DOWNWARDS-FINING QZ-LI SST AT TOP (BUNNYONG)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
BUNNYONG SST MB 76 +934 4 ?
Tectonic Structure:
Remarks ALSO CONTAINS THIN BEDS OF SILICIFIED TUFFACEOUS CLAYSTONES + SILTSTONE

STRATIGRAPHY: CHARBON SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:84 Base Elevation: +926 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS STATE MINE CREEK FM - LONG SWAMP FORMATION

STRATIGRAPHY: LIDSDALE COAL Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:87 Base Elevation: +923 Thickness: 3
Geologic Description: COAL AND CARBONACEOUS SHALE AND SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKMANS FLAT CGL Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:88 Base Elevation: +922 Thickness: 1
Geologic Description: UPWARDS-FINING QUARTZ PEBBLE CONGLOMERATES, LITHIC-QUARTZ SANDSTONES, AND MINOR SILTSTONES. HIGH-ANGLE CROSS-BEDDING
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LITHGOW COAL Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:91 Base Elevation: +919 Thickness: 3
Geologic Description: COAL, CARBONACEOUS SHALE AND SILTSTONE, + MORE RARELY, OIL SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:96 Base Elevation: +914 Thickness: 5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CULLEN BULLEN SUB-GP Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:96 Base Elevation: +914 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS LIDSDALE COAL, BLACKMANS FLAT CGL, LITHGOW COAL + MARRANGAROO CGL

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:TD Base Elevation: +904 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNDERLAIN BY BERRY SILTSTONE OF SHOALHAVEN GROUP (PERMIAN)

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y117
Basal Information: Depth to Base:TD Base Elevation: +904 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WALLERAWANG, CHARBON, CULLEN BULLEN, AND NILE SUB-GROUPS

CONTROL POINT: BURRAGORANG 1.01

REFERENCE # 590

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Rot El	T.Dpth	status code
CLUTHA	DDH (UNDGND) CORED	SI/56-5	34 00'14"S	150 16'52"E	UNDGND	122	-26	148	

REFERENCE: BORELOG DATABASE REPORT FOR CLUTHA BURRAGORANG 101

Page Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code: Y101

Basal Information: Depth to Base:TD Base Elevation: -26* Thickness: >148

Geologic Description: SH, COALY SH, SLTST, CLST, SST, AND COAL. THINLY-IRREG INTBDD-LAMD. SST F-M, S'TIMES COARSE. CARB, PY, CALCITE, MINOR SID &PLANT FOSS DULL COAL

Reported Environment:

Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, WONGAWILLI SMS	39.3	82.7	8.9
COAL, AMERICAN CK SM	56.8	66	3.4
COAL, TONGARRA SMS	87.4	34.6	4.1
COAL, WOONONA SM	120.3	1.7	0.34

Tectonic Structure:

Remarks HOLE DRILLED UNDERGROUND. OTHER COAL: BALGOWNIE UPPER AND LOWER(10.7M, 19.5M), FIGTREE COAL(?142.9M) ARE (1M THICK.

CONTROL POINT: GLEN DAVIS P.O.

REFERENCE # 544

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	SECTION	SI/56-5	33 07'55"S	150 16'45"E	+335	+335	+271	64	

REFERENCE: GOLDBERY, R.
GEOLOGY OF THE WESTERN BLUE MOUNTAINS
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN 20 Page 75-82 Publn Year: 1969

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:6 Base Elevation: +329 Thickness: 5
Geologic Description: LT GY COARSE QUARTZ LITHIC SST WITH SCATTERED PEBBLES + CROSS-BEDDING, POORLY SORTED PEBBLE CONGLOMERATE, + WHITE MEDIUM GRAINED LITHIC SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks OVERLAIN BY (1 METRE OF UNDIFF CULLEN BULLEN SUB-GROUP CONSISTING OF SHALE WITH INTERBEDS OF SANDSTONE

STRATIGRAPHY: CULLEN BULLEN SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:6 Base Elevation: +329 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF (1 M OF SH + SST AND MARRANGAROO CGL

STRATIGRAPHY: GUNDANGAROO FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:18 Base Elevation: +317 Thickness: 12
Geologic Description: GREY, MEDIUM GRAINED, LITHIC SANDSTONE WITH ABUNDANT PLANT [illegible]INS, + DARK GREY SHALE, CARBONACEOUS IN PART
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COOKONGOOBA CK SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:37 Base Elevation: +298 Thickness: 19
Geologic Description: MICAC SLTST, POORLY SRTD PBL CGL, F-M LI SST, F PBLY SST, SLTST WITH SANDY BANDS, SLTST WITH COALY LENSES, SILICIFIED CLAYSTONE. PLANT REMAINS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MT MARSDEN CLAYSTONE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:56 Base Elevation: +279 Thickness: 19
Geologic Description: GY-BUFF WELL-BDD SLTST, BLOCKY SLTST, SLTST WITH CALC BNDS, F MICAC SST,F-M QZ LI SST, SILTY, MICAC AND SILICIFIED CLSTS, SILTY SH. PLANT FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:56 Base Elevation: +279 Thickness: 50

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GUNDANGAROO FM, COORONGOOBA CREEK SANDSTONE AND MOUNT MARSDEN CLAYSTONE

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:56 Base Elevation: +279 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CULLEN BULLEN AND NILE SUB-GROUPS

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: +271 * Thickness:)8
Geologic Description: LT GY SILTSTONE. SANDY IN PART, AND PURPLY GREY WELL BEDDED MICAC SILTSTONE. CONTAINS CARBONACEOUS REMAINS + SCATTERED PEBBLES IN PARTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: +271 * Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BERRY SILTSTONE

CONTROL POINT: KEDUMBA CREEK

REFERENCE # S74

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	SECTION	SI/56-5	33 46'40"S	150 22'30"E	+600 ?	+600 ?	+165 ?	435	

REFERENCE: MCGARRY, D.J.
WELL COMPLETION REPORT MULGOA NO. 2 WELL, SYDNEY BASIN, N.S.W.
AUSTRALIAN OIL + GAS CORPORATION LTD UNPUBL. REPT. BMR FILE 62/1024 Page Publn Year: 1960

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code: Y101
Basal Information: Depth to Base: 148 Base Elevation: +452 Thickness: 148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: OVERLAIN BY TRIASSIC SEDIMENTS. GROUND ELEVATION, & THEREFORE BASE ELEVATION, APPROXIMATE.

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code: Y102
Basal Information: Depth to Base: TD Base Elevation: +165 Thickness: 287
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
KEDUMBA SANDSTONE	TD	+165	34 ?

Tectonic Structure:
Remarks: UNCONFORMABLY UNDERLAIN BY DEVONIAN (FROM GEOLOGICAL SECTION-AFTER DRILLING IN REPORT)

CONTROL POINT: KURRAJONG HEIGHTS 1

REFERENCE # S68 Y1
REFERENCE # S68 Y2
REFERENCE # S68 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
A.O.G./EXOIL	RDH, CORE + WIRELINE	SI/56-5	33 31'45"S	150 37'15"E		+573	-2210	2783	?

REFERENCE: X1 THIS REPORT
Page: Publn Year:
Cross Reference:

REFERENCE: Y1 BRYAN, J.H., MCELROY, C.T., AND ROSE, G.
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5
Page: Publn Year: 1966
Cross Reference: PITT, R.P.B., 1968, BUR. MIN. RES. RECORD 1968/81 // BMR, 1963, PET. SEARCH SUB. ACTS PUBLN. 12

REFERENCE: Y2 MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149
Page: Publn Year: 1974
Cross Reference: PITT, R.P.B., 1968, BUR. MIN. RES. RECORD 1968/81

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: NEWCASTLE CM EQUIVAL Age: PERMIAN Interpretation Code: X110
Basal Information: Depth to Base: 1051 Base Elevation: -478 Thickness: 163
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOMAGO CM EQUIVALENT Age: PERMIAN Interpretation Code: X120
Basal Information: Depth to Base: 1390 Base Elevation: -817 Thickness: 339
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code: X125
Basal Information: Depth to Base: 1390 Base Elevation: -817 Thickness: 502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ILLAWARRA CM TOP AT -315 M.

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: Y101
Basal Information: Depth to Base: 888 Base Elevation: -315 Thickness: 888
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONSISTS OF HAWKESBURY SST (0-226 M) + NARABEEN GROUP

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1026 Base Elevation: -453 Thickness: 138
Geologic Description: SIDERITIC F-M GR 1) CLAYEY + PEBBLY, QZOSE + 2) LI + FLD SUBGWKES, LI GWKE, LAMD, CARB, ARG SEDS WITH MUDDY VF SUBGWKE AND COAL SEAMS (PITT '68)
Reported Environment: REDUCING CONDITIONS IN SUBAQUEOUS LOW ENERGY ENVIRON - LACUSTRINE OR SWAMP ENVIRON. POSS MARINE INCURSIONS. CLOSE ERUPTIVE VOLCANIC CENTRE.
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	911	-338	2 CA
COAL	969	-396	4.5 CA

Tectonic Structure:
Remarks REPORTED ENVIRONMENT ALSO FROM PITT, 1968. COALY THROUGHOUT

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1370 Base Elevation: -797 Thickness: 344
Geologic Description: CARB MDST-CLST WITH VF LI +FLD SUBGWKE + PARTY TFAC SLTST, INTBDD CARB ARG SED + MUDDY VF SUBGWKE, COAL, PELY + CLAYEY F-M SUBGWKE, ARKOSE, CGL
Reported Environment: DELTAIC ENVIRONMENT AT BASE TO RESTRICTED LAGOONAL ENVIRONMENT ABOVE
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1291	-718	62
COAL INTERVAL	1357	-784	9

Tectonic Structure:
Remarks GEOLOGICAL DESCRIPTION + REPORTED ENVIRONMENT FROM PITT, 1968. COALY THROUGHOUT

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1370 Base Elevation: -797 Thickness: 482
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SYDNEY + CUMBERLAND SUB-GROUPS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:2397 Base Elevation: -1824 Thickness: 1027
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: VOLCANICS Age: CARB-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -2210± Thickness: >386
Geologic Description: BASALTIC LAVAS, RHYOLITIC LAVA AND TUFF, AND ANDESITIC VOLCANIC ROCKS (PITT, 1968)
Reported Environment: ?TERRESTRIAL IGNEOUS ACTIVITY (PITT, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:889 Base Elevation: -316 Thickness: 889
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST (0-223 M) AND NARRABEEN GROUP

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1391 Base Elevation: -818 Thickness: 502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1676 Base Elevation: -1103 Thickness: 9
Geologic Description: M-C CARBONATE CEMENTED SUB-GREYWACKE (PITT, 1968)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:1667 Base Elevation: -1094 Thickness: 276
Geologic Description: INTLAMD + INTBDD MICAC CARB SLTST, MUDDY VF QZOSE SUBGWKE, MDST-SANDY SLTST + M-C CARBONATE CMTD QZOSE SUBGWKE. LAMD + MASS BDG, MICRO-XBDG.
Reported Environment: RESTRICTED MARINE, POSSIBLY DEEP LAGOONAL OR GULF, WITH GENTLE, STEADY BOTTOM CURRENTS. SLIGHTLY NEARER TO SHORE + WAVE BASE NEAR BASE OF UNIT.
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO, ?BIOTURB, PLT FRAGS, WORM TUBES, FORAMS, ?BRACH + ?CRINOID FRAGMENTS. LITHOLOGIES + ENVIRON - PITT, 1968

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1890 Base Elevation: -1317 Thickness: 214
Geologic Description: THINLY INTBDD F+C MUDDY QZOSE SUBGWKE, INTLAMD VF QZOSE SUBGWKE + SLTST, + MUDDY VF SUBGWKE. CARB, MICAC. LITHOL MIXING, MICROXBDG (PITT, 1968)
Reported Environment: BELOW WAVE BASE IN A REDUCING MARINE ENVIRONMENT WITH BOTTOM CURRENTS OF VARYING VELOCITY. EVIDENCE OF ICE-RAFTING + GLACIATION (PITT, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO, SCALLOP STRUCTURES, BRACHIOPOD FRAGMENTS, AND HORIZONTAL + LARGE VERTICAL WORM TUBES (PITT, 1968)

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:2129 Base Elevation: -1556 Thickness: 239
Geologic Description: INTBDD F+C MUDDY PROTOQZITE-QZOSE SUBGWKE, F QZOSE SUBGWKE, CARB MICAC ARG SED, C CARBONATE CMTD PROTOQZITE. PBLY. MASSIVE + LAMD, MICRO XBDG.
Reported Environment: REDUCING MARINE ENVIRONMENT, WITH VARIABLE ENERGY CONDITIONS. PROTOQZITES MAY REPRESENT OFFSHORE BAR DEVELOPMENTS (PITT, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO, BRACH FRAGMENTS, WORM TUBES + CARBONIZED PLANT FRAGMENTS. GEOLOGIC DESCRIPTION FROM PITT, 1968.

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:2364 Base Elevation: -1791 Thickness: 235
Geologic Description: INTLAMD ARG SED + F QZOSE SUBGWKE, F+C QZOSE SUBGWKE, INTBDD C SLTST + VF QZOSE SUBGWKE-PROTOQZITE, SL SANDY V CARB PY MDST. PBLY. MASS, SL LAMD
Reported Environment: REDUCING MARINE ENVIRONMENT, WITH VARIABLE ENERGY CONDITIONS. RESTRICTED, VERY LOW ENERGY LAGOONAL ENVIRONMENT AT BASE. GLACIATION? (PITT,1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO, SLIGHTLY MIXED + CONTAINS BRACH FRAGS, WORM TUBES, PY CARB PLT FRAGS + GLENDONITES. LITHOLOGIES FROM PITT, 1968

STRATIGRAPHY: WASP HEAD FORMATION Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:2399 Base Elevation: -1826 Thickness: 35
Geologic Description: M GR CARBONATE CEMENTED QZOSE SUBGWKE-QZOSE ARKOSE, CARB, PY MDST-SLTST, + ONE V THIN COAL SEAM. THICK FAINTLY LAMD BDG, PLT FRAGS (PITT, 1968)
Reported Environment: REDUCING CONDITIONS IN ALTERNATELY QUIET + AGITATED WATER. PERHAPS TRANSITIONAL BETWEEN LACUSTRINE + LAGOONAL CONDITIONS (PITT, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y289
Basal Information: Depth to Base:2399 Base Elevation: -1826 Thickness: 509
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT, PEBBLEY BEACH + WASP HEAD FMS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:2399 Base Elevation: -1826 Thickness: 1009
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BERRY SILTSTONE, NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -2210% Thickness: >384
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LITHGOW NEWNES 31

REFERENCE # S70

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ELECOM	DDH	SI/56-S	33 19'34"S	150 09'41"E	1082	1082	607	475	

REFERENCE: X1

THIS REPORT — Page: — Publn Year:

Cross Reference: WRITTEN COMMUNICATION FROM C.E. CRAPP (ELECOM) AND J. HUNT (CSIRO)

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: NARRABEEN GP — Age: TRIASSIC — Interpretation Code: X101
Basal Information: Depth to Base: 202 — Base Elevation: 880 — Thickness: 202
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ANGUS PLACE SST — Age: PERMIAN — Interpretation Code: X102
Basal Information: Depth to Base: 245 — Base Elevation: 837 — Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks: ILLAWARRA CM

STRATIGRAPHY: LITHGOW COAL — Age: PERMIAN — Interpretation Code: X103
Basal Information: Depth to Base: 315 — Base Elevation: 767 — Thickness: ?
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks: ILLAWARRA CM

STRATIGRAPHY: ILLAWARRA CM — Age: PERMIAN — Interpretation Code: X104
Basal Information: Depth to Base: 320 — Base Elevation: 762 — Thickness: 118
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, LITHGOW SM	315	767	?

Tectonic Structure:
Remarks: CONTAINS ANGUS PLACE SST AND LITHGOW COAL. ELECOM DRILLED TO 320 M; CSIRO CONTINUED HOLE TO 475 M.

STRATIGRAPHY: SHOALHAVEN GP — Age: PERMIAN — Interpretation Code: X105
Basal Information: Depth to Base: 463 — Base Elevation: 619 — Thickness: 143
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature — Depth — Elevation — Thickness
Tectonic Structure:
Remarks: ELECOM DRILLED TO 320 M; HOLE DRILLED TO 475 M BY CSIRO.

STRATIGRAPHY: BASEMENT — Age: DEVONIAN — Interpretation Code: X106

Basal Information: Depth to Base:TD Base Elevation: 607* Thickness:)12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WALFORD GULLY

REFERENCE # S72

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	SECTION	S1/56-5	33 37'36"S	150 21'33"E	+778	+778	+377	401	

REFERENCE: GOLDBERY, R.
GEOLOGY OF THE WESTERN BLUE MOUNTAINS
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN 20 Page 119-126 Publn Year: 1969

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:150 Base Elevation: +628 Thickness: 150
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:263 Base Elevation: +515 Thickness: 113
Geologic Description: BRIGHT + DULL BNDD COAL, CARB SH, BLOCKY CLST, GY SLTST WITH SANDY BNDS, INTBDD SLTST + GY SH, M LI SST WITH SILTY BNDS, M QZ LI SST. PLANT REM
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
KATOOMBA COAL MEMBER	152	+626	1.3
BURRAGORANG CLST	167	+611	11.6
LITHGOW COAL	256	+522	1.1

Tectonic Structure:
Remarks ABOUT 45 M OF SECTION (BETWEEN 167 AND 212 M) OBSCURED BY TALUS

STRATIGRAPHY: MARRANGAROO CGL Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:267 Base Elevation: +511 Thickness: 4
Geologic Description: M-C QUARTZ LITHIC SANDSTONE WITH CONGLOMERATE BANDS UP TO 30 CM THICK. CONGLOMERATE CONTAINS QUARTZ + QUARTZITE CLASTS UP TO 7.6 CM
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUNDANGAROO FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:273 Base Elevation: +505 Thickness: 6
Geologic Description: DULL COAL WITH BRIGHT BANDS, STONY COAL + CY-CARB SHALE, GY SILTSTONE WITH SANDY BANDS, + M-F SST WITH CONGLOMERATIC PHASES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COORONGOOBA CK SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:298 Base Elevation: +480 Thickness: 25
Geologic Description: M LITHIC SST, F SST WITH BLACK SILTY BANDS, F WHITE QUARTZ LITHIC SST, GY SHALE, AND GY CLAYSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MT MARSDEN CLAYSTONE Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:310 Base Elevation: +468 Thickness: 12
Geologic Description: GY PARTLY SHALY CLAYSTONE, PARTLY SANDY SILTSTONE, CREAM-BUFF MASSIVE BLOCKY CLAYSTONE, GY SHALE WITH CARBONACEOUS FLECKS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NILE SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:310 Base Elevation: +468 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS GUNDANGAROO FM, COORONGOOBA CREEK SST + MOUNT MARSDEN CLAYSTONE

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:310 Base Elevation: +468 Thickness: 160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFF ILLAWARRA CM, MARRANGAROO CONGLOMERATE AND NILE SUB-GROUP

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: +377 ± Thickness:)91
Geologic Description: WELL-BDD CRYSTALLINE LST, GY MICAC SLTST WITH SWIRLS OF DK SILTY + SANDY MATERIAL T'OUT. ERRATIC BOULDERS AT IRREGULAR INTERVALS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: +377 ± Thickness:)91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BERRY SILTSTONE

CONTROL POINT: WOODFORD DDH 1

REFERENCE # S73 Y1
REFERENCE # S73 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-5	33 [illegible]'21"S	150 24'48"E		+649	+144	505	?

REFERENCE: BRYAN, J.H., MCELROY, C.T., AND ROSE, G
SYDNEY, 1:250,000 GEOLOGICAL SERIES
GEOLOGICAL SURVEY OF N.S.W. EXPLANATORY NOTES SI/56-5 Page Publn Year: 1966

Cross Reference:

REFERENCE: Y2 GOLDBERY, R
GEOLOGY OF THE WESTERN BLUE MOUNTAINS
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN 20 Page 149 Publn Year: 1969

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, WEST

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:374 Base Elevation: +275 Thickness: 374
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +144 * Thickness:)131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:367 Base Elevation: +282 Thickness: 367
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CHARBON SUB-GP Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:TD Base Elevation: +144 * Thickness:)138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL:KATOOMBA SEAM	368	+201	1.2
COAL:WOODFORD SEAM	379	+270	1.1
COAL:MIDDLE RIVER SM	389	+260	1.0
COAL:UNCORRELATED SM	423	+226	2.3

Tectonic Structure:
Remarks: UNCORRELATED CEAM AT 432 M DEPTH (-217 M), 2.6 M THICK

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y203

Basal Information: Depth to Base:TD Base Elevation: +144 ± Thickness:)139
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS CHARBON SUB-GP

SYDNEY

BASIN

SOUTH

CONTROL POINT: BADGELLY 1

REFERENCE # S93

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-9	34 02'42"S	150 47'41"E	90	91	-569	650	

REFERENCE: WRIGHT, A.J.
A.O.G. BADGELLY NO. 1 SYDNEY BASIN, N.S.W. WELL COMPLETION REPORT. PETROLEUM WCR 98
UNPUBLISHED COMPANY REPORT(AUST. OIL & GAS CORP.) NSW DEPT. MINES M'FILM Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: WIANAMATTA GROUP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:89 Base Elevation: 2 Thickness: 89
Geologic Description: GREY TO DARK GREY SHALE WITH LIGHT GREY SILTSTONE INTERBEDS. MICACEOUS, PLANT REMAINS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HAWKESBURY SST Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:280 Base Elevation: -189 Thickness: 192
Geologic Description: WHITE TO LIGHT GREY, POORLY SORTED, QUARTZOSE SANDSTONE. CONGLOMERITIC IN PART, ARGILLACEOUS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NARRABEEN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -569# Thickness:)380
Geologic Description: SANDSTONE WITH THIN, GREY, RED, AND GREEN INTERBEDS. SST IS F-M, POORLY SORTED, PBLY-CGL TOWARD BASE.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BALD HILL CLST EQUIV	341	-250	29

Tectonic Structure:
Remarks RED-CHOCOLATE SHALES ARE CORRELATED TO THE BALD HILL CLAYSTONE

CONTROL POINT: BELANGLO 1A

REFERENCE # S110Y1
REFERENCE # S110X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ILLAW. COKE CO.	DDH, CORE	SI/56-9	34 32'44"S	150 16'26"E	643	643	460	183	?

REFERENCE: ILLAWARRA COKE COMPANY
LITHOLOGIC LOG FOR BELANGLO NO. 1A
JOINT COAL BOARD UNPUBLISHED BORE DATA
Page Publn Year:
Cross Reference:

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:107 Base Elevation: +535 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:117 Base Elevation: +525 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:122 Base Elevation: 520 Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # ALLANS CREEK FM AND KEMBLA SST (COMBINED THICKNESS 5 M) DIFFICULT TO DISTINGUISH

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:122 Base Elevation: 520 Thickness: 0
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DARKES FOREST SST IS ABSENT.

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:130 Base Elevation: 512 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:135 Base Elevation: 507 Thickness: 5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: 460* Thickness:)76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks WONGAWILLI COAL, ALLANS CREEK FM, BARGO CLAYSTONE, TONGARRA COAL.

STRATIGRAPHY: ILLAWARRA GM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: 460* Thickness:)76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:107 Base Elevation: 536 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: 460* Thickness:)76
Geologic Description: SH, COAL DOMINATE TOP; F-M SST, SH, COAL MIDDLE; F-M SST WITH SH AND CGL AT BOTTOM. INTRDD-LAND, CARB, SOME PLANT IMPRESSIONS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, WONGAWILLI SM 117 526 8
COAL, TONGARRA SM 135 508 5
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA GM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: 460* Thickness:)76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL, WONGAWILLI SM 117 526 8
COAL, TONGARRA SM 135 508 5
Tectonic Structure:

Remarks CONTAINS SYDNEY SUB-GP

CONTROL POINT : BORE 32 (WOLLONGONG)

REFERENCE # S101

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 15'18"S	150 36'25"E		+312	-274	586	

REFERENCE: BUNNY, M.R.
GEOLOGY AND COAL RESOURCES OF THE SOUTHERN CATCHMENT COAL RESERVE, SOUTHERN SYDNEY BASIN, NEW SOUTH WALES
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 22 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:414 Base Elevation: -102 Thickness: 414
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:416 Base Elevation: -104 Thickness: 2
Geologic Description:
Reported Environment: REPRESENTS PART OF A TOP-DELTAIC DEVELOPMENT OF COAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:437 Base Elevation: -125 Thickness: 21
Geologic Description:
Reported Environment: TYPICALLY FLUVIAL (POINT-BAR - FLOOD PLAIN)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	423	-111	1.2
BURRAGORANG CLST	427	-115	4
COAL	428	-116	<1

Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:446 Base Elevation: -134 Thickness: 9
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:452 Base Elevation: -140 Thickness. 6
Geologic Description:
Reported Environment: FLUVIAL SYSTEM FLOWING ACROSS AREA IN A NORTHEASTERLY DIRECTION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:461 Base Elevation: -149 Thickness: 9
Geologic Description:
Reported Environment: THIS FORMATION REPRESENTS THE FINER FLOOD-BASIN FLUVIAL SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:476 Base Elevation: -164 Thickness: 15
Geologic Description:
Reported Environment: FLUVIAL DEPOSITION FROM A CONTRIBUTIVE STREAM SYSTEM FLOWING IN A GENERAL NORTHEASTERLY DIRECTION ACROSS THE AREA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:487 Base Elevation: -175 Thickness: 11
Geologic Description:
Reported Environment: AS FOR ALLANS CREEK FM
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:489 Base Elevation: -177 Thickness: 2
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:517 Base Elevation: -205 Thickness: 28
Geologic Description:
Reported Environment: FLUVIAL FLOOD-BASIN (POINT-BAR - OVERBANK). WOONONA COAL MEMBER - FLUVIAL TO DELTAIC
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	495	-183	11
WOONONA COAL MEMBER	517	-205	1

Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:517 Base Elevation: -205 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ALL FORMATIONS FROM BASE OF TRIASSIC TO THIS DEPTH

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -274 # Thickness: 169
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Yi13
Basal Information: Depth to Base:TD Base Elevation: -274 ft Thickness:)172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY AND CUMBERLAND SUB-GROUPS, AS ABOVE

CONTROL POINT: BORE 37 (WOLLONGONG)

REFERENCE # 5100

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 17'18"S	150 45'56"E		+332	-244	576	

REFERENCE: BUNNY, M.R.
GEOLOGY AND COAL RESOURCES OF THE SOUTHERN CATCHMENT COAL RESERVE, SOUTHERN SYDNEY BASIN, NEW SOUTH WALES
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 22 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:435 Base Elevation: -103 Thickness: 435
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:439 Base Elevation: -107 Thickness: 4
Geologic Description:
Reported Environment: REPRESENTS PART OF A TOP DELTAIC DEVELOPMENT OF COAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:469 Base Elevation: -137 Thickness: 30
Geologic Description:
Reported Environment: TYPICALLY FLUVIAL (POINT-BAR - FLOODPLAIN)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	447	-115	1.5
COAL	461	-129	2.7

Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:478 Base Elevation: -146 Thickness: 9
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:486 Base Elevation: -154 Thickness: 8
Geologic Description:
Reported Environment: FLUVIAL SYSTEM FLOWING ACROSS AREA IN A NORTHEASTERLY DIRECTION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:500 Base Elevation: -168 Thickness: 14
Geologic Description:
Reported Environment: THIS FORMATION REPRESENTS THE FINER FLOOD-BASIN FLUVIAL SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:512 Base Elevation: -180 Thickness: 12
Geologic Description:
Reported Environment: FLUVIAL DEPOSITION FROM A CONTRIBUTIVE STREAM SYSTEM FLOWING IN A GENERAL NORTHEASTERLY DIRECTION ACROSS THE AREA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:524 Base Elevation: -192 Thickness: 12
Geologic Description:
Reported Environment: AS FOR ALLANS CREEK FM
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:526 Base Elevation: -194 Thickness: 2
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:555 Base Elevation: -223 Thickness: 29
Geologic Description:
Reported Environment: FLUVIAL FLOOD-BASIN (POINT-BAR - OVERBANK).
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 533 -201 1.4
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:555 Base Elevation: -223 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ALL FORMATIONS FROM BASE OF TRIASSIC TO THIS DEPTH

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -244 * Thickness:)21
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code: Y113
Basal Information: Depth to Base: TD Base Elevation: -244 # Thickness:)141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY AND CUMBERLAND SUB-GROUPS, AS ABOVE

CONTROL POINT: BORE 5 (WOLLONGONG)

REFERENCE # S102Y1
REFERENCE # S102X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 21'48"S	150 30'22"E		+579	+222	357	

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: BUNNY, M.R., 1972, GEOL. SURV. N.S.W. BULLETIN 22

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:292 CA Base Elevation: +287 Thickness: 292 CA
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: DEPTH TO BASE FROM FIG. 31, BUNNY, 1972 - STRUCTURE CONTOURS ON THE TOP OF THE BULLI COAL

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:319 Base Elevation: +260 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: +222 * Thickness:)65 CA
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES DARKES FOREST SST

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:319 Base Elevation: +260 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS NOT GIVEN

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +222 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES DARKES FOREST SST. THICKNESS NOT GIVEN AS DEPTH TO BASE OF TRIASSIC NOT KNOWN

CONTROL POINT: BORE 72 (CAMDEN)

REFERENCE # S94

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 05'47"S	150 52'27"E		+196	-697	893	

REFERENCE: BUNNY, M.R.
GEOLOGY AND COAL RESOURCES OF THE SOUTHERN CATCHMENT COAL RESERVE, SOUTHERN SYDNEY BASIN, NEW SOUTH WALES
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 22 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:615 Base Elevation: -418 Thickness: 614
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:616 Base Elevation: -420 Thickness: 2
Geologic Description:
Reported Environment: REPRESENTS PART OF A DELTAIC DEVELOPMENT OF COAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY AND CUMBERLAND SUB-GROUPS, AS ABOVE

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:722 Base Elevation: -526 Thickness: 106
Geologic Description:
Reported Environment: TYPICALLY FLUVIAL (POINT-BAR - FLOODPLAIN). SOME DELTAIC SANDS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BALGOWNIE COAL MB	646	-450	1.5
COAL	659	-463	1.2
WORONORA COAL MEMBER	705	-509	6.3
NOVICE SST MEMBER	722	-526	17.5

Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:728 Base Elevation: -532 Thickness: 6
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:742 Base Elevation: -546 Thickness: 14
Geologic Description:
Reported Environment: FLUVIAL SYSTEM FLOWING ACROSS AREA IN A NORTHEASTERLY DIRECTION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:762 Base Elevation: -566 Thickness: 20
Geologic Description:
Reported Environment: THIS FORMATION REPRESENTS THE FINER FLOOD-BASIN FLUVIAL SEDIMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:775 Base Elevation: -579 Thickness: 13
Geologic Description:
Reported Environment: FLUVIAL DEPOSITION FROM A CONTRIBUTIVE STREAM SYSTEM FLOWING IN A GENERAL NORTHEASTERLY DIRECTION ACROSS THE AREA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:802 Base Elevation: -606 Thickness: 27
Geologic Description:
Reported Environment: AS FOR ALLANS CREEK FM
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:808 Base Elevation: -612 Thickness: 6
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:884 Base Elevation: -688 Thickness: 76
Geologic Description:
Reported Environment: FLUVIAL FLOOD-BASIN (POINT-BAR - OVERBANK). WOONONA COAL MEMBER - FLUVIAL TO DELTAIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
WOONONA COAL MEMBER 884 -688 1.7
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:884 Base Elevation: -688 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ALL FORMATIONS FROM BASE OF TRIASSIC TO THIS DEPTH

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -697 * Thickness:)9
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -697 # Thickness:)279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY AND CUMBERLAND SUB-GROUPS, AS ABOVE

CONTROL POINT: BORE 75 (CAMDEN)

REFERENCE # S96

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 05'32"S	150 59'14"E		+98	-820	918	

REFERENCE: BUNNY, N.R.
GEOLOGY AND COAL RESOURCES OF THE SOUTHERN CATCHMENT COAL RESERVE, SOUTHERN SYDNEY BASIN, NEW SOUTH WALES
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 22 Page Publn Year: 1972

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:535 Base Elevation: -437 Thickness: 535
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNNAMED Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:544 Base Elevation: -446 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 536 -438 1
Tectonic Structure:
Remarks

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:545 Base Elevation: -447 Thickness: 1
Geologic Description:
Reported Environment: REPRESENTS PART OF A TOP-DELTAIC DEVELOPMENT OF COAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:636 Base Elevation: -538 Thickness: 91
Geologic Description:
Reported Environment: TYPICALLY FLUVIAL (POINT-BAR - FLOODPLAIN). SOME DELTAIC SANDS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BALGOWNIE COAL MB	568	-471	2.4
COAL	592	-494	1
WORONORA COAL MEMBER	615	-517	9
NOVICE SST MEMBER	636	-538	21

Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:643 Base Elevation: -545 Thickness: 7
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks COMPOSITE ANALYSIS: A - 38.1% ASH; A EXCL. ASH >40% - 28.9%; A EXCL. ASH >30% - 25.2% ASH

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:655 Base Elevation: -557 Thickness: 12
Geologic Description:
Reported Environment: FLUVIAL SYSTEM FLOWING ACROSS AREA IN A NORTHEASTERLY DIRECTION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	647	-549	1

Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:696 Base Elevation: -598 Thickness: 41
Geologic Description:
Reported Environment: THIS FORMATION REPRESENTS THE FINER FLOOD-BASIN FLUVIAL SEDIMENTS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:706 Base Elevation: -608 Thickness: 10
Geologic Description:
Reported Environment: FLUVIAL DEPOSITION FROM A CONTRIBUTIVE STREAM SYSTEM FLOWING IN A GENERAL NORTHEASTERLY DIRECTION ACROSS THE AREA
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:745 Base Elevation: -647 Thickness: 39
Geologic Description:
Reported Environment: AS FOR ALLANS CREEK FM
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:749 Base Elevation: -651 Thickness: 4
Geologic Description:
Reported Environment: FLUVIAL
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:852 Base Elevation: -754 Thickness: 103
Geologic Description:
Reported Environment: FLUVIAL FLOOD-BASIN (POINT-BAR - OVERBANK). WOONONA COAL MEMBER - FLUVIAL TO DELTAIC
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
WOONONA COAL MEMBER	852	-754	18

Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y112

Basal Information: Depth to Base:852 Base Elevation: -754 Thickness: 317
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ALL FORMATIONS FROM BASE OF TRIASSIC TO THIS DEPTH

STRATIGRAPHY: ERINS VALE FM Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -820 * Thickness:)66
Geologic Description: KULNURA MARINE TONGUE CONTAINS TERRAKEA SP. AND STROPHALOSIA OVALIS
Reported Environment: FLUVIAL TO DELTAIC. KULNURA MARINE TONGUE - MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
KULNURA MARINE TONG. TD)43
Tectonic Structure:
Remarks

STRATIGRAPHY: KULNURA MARINE TNG Age: PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:TD Base Elevation: -820* Thickness:)43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SEE ERINS VALE FM

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y115
Basal Information: Depth to Base:TD Base Elevation: -820* Thickness:)66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF ERINS VALE FM; KULNURA MARINE TNG AT BASE

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y116
Basal Information: Depth to Base:TD Base Elevation: -820* Thickness:)394
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SYDNEY AND CUMBERLAND SUB-GP

CONTROL POINT: BORE 81 (WOLLONGONG)

REFERENCE # S104Y1
REFERENCE # S104X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 24'03"S	150 38'17"E		+442	-132	574	

REFERENCE: BUNNY, M.R.
GEOLOGY AND COAL RESOURCES OF THE SOUTHERN CATCHMENT COAL RESERVE, SOUTHERN SYDNEY BASIN, NEW SOUTH WALES
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 22 Page Publn Year: 1972
Cross Reference:

REFERENCE: X1
THIS REPORT Page Publn Year:
Cross Reference: BUNNY, M.R., 1972, GEOL. SURV. N.S.W. BULLETIN 22

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:352 CA Base Elevation: +90 Thickness: 352 CA
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE FROM FIG. 31, BUNNY, 1972 - STRUCTURE CONTOURS ON THE TOP OF THE BULLI COAL

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:389 Base Elevation: +58 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -132 * Thickness: >222
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS APPROXIMATE

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:389 Base Elevation: +58 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS NOT GIVEN

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -132 * Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks INCLUDES DARKES FOREST SST. THICKNESS NOT GIVEN AS DEPTH TO BASE OF TRIASSIC NOT KNOWN

CONTROL POINT: CALLALA DDH 1

REFERENCE # S114

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH, CORED	SI/56-9	34 59'06"S	150 41'18"E		38	-547	585	

REFERENCE: Y101 BEMBRICK, C.S., AND HOLMES, G.G.
AN INTERPRETATION OF THE SUBSURFACE GEOLOGY OF THE NOWRA-JERVIS BAY AREA
RECORDS OF THE GEOLOGICAL SURVEY OF NEW SOUTH WALES V 18(1) Page 5-68 Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:50 Base Elevation: -12 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:276 Base Elevation: -238 Thickness: 225
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
INTRUSIVE DOLERITE 145 -147 95
Tectonic Structure:
Remarks CURRAMBENE DOLERITE TOP 95 METRES

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:483 Base Elevation: -445 Thickness: 207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:483 Base Elevation: -445 Thickness: 432
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SNAPPER POINT AND PEBBLY BEACH FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:483 Base Elevation: -445 Thickness: 483
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WANDRAWANDIAN SLTST, SNAPPER POINT FM, PEBBLY BEACH FM

STRATIGRAPHY: YARRUNGA CM Age: PERMIAN Interpretation Code:Y107

Basal Information: Depth to Base:521 Base Elevation: -483 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO THE CLYDE COAL MEASURES.

STRATIGRAPHY: TALLONG CGL Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:570 Base Elevation: -532 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TALATEPANG GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:570 Base Elevation: -532 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TALLONG CGL

STRATIGRAPHY: METAMORPHICS Age: ? Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -547+ Thickness: ?15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CATARACT 1

REFERENCE # S99 Y1
REFERENCE # S99 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	WELL	SI/56-9	34 19'00"S	150 53'00"E	+380 ?	+380 ?	-927 ?	1307	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S. AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:250 Base Elevation: +161 Thickness: 250
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:380 Base Elevation: +31 Thickness: 130
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. BASE OF BARKES FOREST SST ABOVE +70 - +100 M

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:942 Base Elevation: -531 Thickness: 562
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:942 Base Elevation: -531 Thickness: 692
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY & CUMBERLAND SUB-GROUPS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -895 ± Thickness:)364
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THIS INTERPRETATION OF CATARACT 1 BASED ON UNPUBLISHED THIN-SECTION WORK BY E. NICHOLAS

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y181
Basal Information: Depth to Base:336 Base Elevation: +44 Thickness: 336
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST + NARRABEEN GROUP. DEPTH TO BASE OF UNIT UNCERTAIN

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:941 Base Elevation: -561 Thickness: 605
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE OF UNIT UNCERTAIN

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -927 * Thickness:)366
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO TOP OF UNIT UNCERTAIN

CONTROL POINT: CLYDE RIVER

REFERENCE # S120

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	Status code
GEOL. SURV. NSW	SECTION	SI/56-13	35 11'36"S	150 15'33"E	+425	+425	+384	41	

REFERENCE: X1 MCELROY, C.T., & ROSE, G.
RECONNAISSANCE GEOLOGICAL SURVEY: ULLADULLA 1-MILE MILITARY SHEET, AND SOUTHERN PART OF TIANJARA 1-MILE MILITARY SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES, BULLETIN 17 Page 40-42 Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: CLYDE COAL MEASURES Age: PERMIAN Interpretation Code:X101
Basal Information: Depth to Base: Base Elevation: +384 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNDERLIES SHOALHAVEN GP. TYPE SECTION FOR CLYDE CM

CONTROL POINT: COONEMIA 1

REFERENCE # S113Y1
REFERENCE # S113Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GENDA OIL N.L.	RDH, CORE + WIRELINE	SI/56-9	34 58'20"S	150 42'50"E	+15	+19	-778	797	?

REFERENCE: Y1 CONDON, M.A.
GENDA OIL N.L. WELL COMPLETION REPORT, COONEMIA NO.1 WELL, P.E.L. 154 N.S.W.
GENDA OIL N.L. UNPUBLISHED REPORT (BMR FILE 69/2018) Page Publn Year: 1969
Cross Reference:

REFERENCE: Y2 BEMBRICK, C.S., AND HOLMES, G.G.
AN INTERPRETATION OF THE SUBSURFACE GEOLOGY OF THE NOWRA-JERVIS BAY AREA
THE GEOLOGICAL SURVEY OF NEW SOUTH WALES RECORD 18 (1), 5-68 Page Publn Year: 1976
Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:18 Base Elevation: +1 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:134 Base Elevation: -115 Thickness: 116
Geologic Description: MEDIUM HARD, DARK GREY MICACEOUS CARBONACEOUS SILTSTONE WITH SCATTERED SAND GRAINS. SOME IRREGULAR LAMINATION
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:271 Base Elevation: -252 Thickness: 137
Geologic Description: WHITE, CREAM, PALE GREY, FINE-COARSE GRAINED QUARTZ SST WITH SCATTERED PEBBLES. CEMENTED BY SILICA. MINOR PYRITE, GLAUCONITE. TWO BASALTIC MBS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASALT-BASALTIC TUFF	149	-130	15
BASALT-BASALTIC TUFF	238	-219	26

Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:337 Base Elevation: -318 Thickness: 66
Geologic Description: MEDIUM HARD, DK GY, MICACEOUS, CARBONACEOUS SANDY SILTSTONE WITH SCATTERED PEBBLES OF QZITE, QZ AND IGNEOUS ROCK; PYRITE, GLAUCONITE; BRACHS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:437 Base Elevation: -418 Thickness: 100
Geologic Description: PBLY SST, LT GY M-C POORLY SRTD QZ SST-QZWACKE WITH PY + GLAUC, DK GY MICAC CARB SANDY + PBLY SLTST WITH PY + GLAUC, AND PEBBLE CONGLOMERATE

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CONJOLA FM BY CONDON

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:511 Base Elevation: -492 Thickness: 74
Geologic Description: DK GY, MICAC CARB SLTST WITH PY, GLAUC + SAND GRS, AND MINOR M GR, POORLY SRTD QUARTZWACKE AND FISSILE BLK CARB SH; BRACHIOPODS COMMON IN SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED PIGEON HOUSE CREEK SILTSTONE BY CONDON

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:511 Base Elevation: -492 Thickness: 174
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT AND PEBBLEY BEACH FORMATIONS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:511 Base Elevation: -492 Thickness: 493
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BERRY SILTSTONE, NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE, AND CONJOLA SUB-GROUP

STRATIGRAPHY: CLYDE COAL MEASURES Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:579 Base Elevation: -560 Thickness: 68
Geologic Description: DK GY-DK BR CARB SHALE, M GR QZ SST WITH SILIC AND CALC CEMENT, DK GY MICAC CARB SILTSTONE, AND HARD, BLACK ?BITUMINOUS COAL BEDS, SOME SHALY
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	531	-512	14
COAL	545	-526	3
COAL INTERVAL	576	-557	5

Tectonic Structure:
Remarks

STRATIGRAPHY: CONGLOMERATE Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:718 Base Elevation: -699 Thickness: 139
Geologic Description: DK GY-GN PEBBLE CONGLOMERATE, WITH ROUNDED-SUBANGULAR PEBBLES OF QZ, QZITE, SILICIFIED SST, PHYLLITE AND IGNEOUS RX IN F-C GR SILIC GWKE MATRIX
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: E. PALAEOZOIC Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -778 ± Thickness: 779
Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:134 Base Elevation: -115 Thickness: 130
Geologic Description:
Reported Environment: MODERATELY DEEP SHELF. STRONG CURRENTS PERIODICALLY ACTIVE. PEBBLES, PEBBLE CLUSTERS + MEGACLASTS MAY REPRESENT "DROPPED PEBBLES" FROM ICE RAFTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:272 Base Elevation: -253 Thickness: 138
Geologic Description:
Reported Environment: SHALLOW MARINE, HIGH ENERGY ENVIRONMENT ABOVE WAVE BASE. SOME DEPOSITION IN SUB-TIDAL + SHELTERED ENVIRONMENT AND SOME DEPOSITION FROM ICE-FLOES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
CURRAMBENE DOLERITE 149 -131 15
PORPHYRITIC DOLERITE 238 -219 22
Tectonic Structure:
Remarks CURRAMBENE DOLERITE:- K-AR DATING ESTABLISHED AN AGE OF 234 +/- 6 M.Y. (LATE PERMIAN)

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:512 Base Elevation: -493 Thickness: 240
Geologic Description: PEBBLY QUARTZOSE SST, MODERATELY TO POORLY SORTED WITH 90% OF GRAINS QUARTZ, 10% ROCK FRAGMENTS. SOME CARBONATE, POSSIBLY SIDERITE
Reported Environment: LOWER 2/3 - SHALLOW SHELF WITH FLOATING ICE DAMPENING WAVES + REDUCING EFFECTIVE WAVE BASE; ICE-RAFTING. UPPER 1/3 - SUBTIDAL + TIDAL FLATS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:512 Base Elevation: -493 Thickness: 378
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT FM AND PEBBLEY BEACH FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:512 Base Elevation: -493 Thickness: 508
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP

STRATIGRAPHY: YARRUNGA FM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:577 Base Elevation: -558 Thickness: 65
Geologic Description:
Reported Environment: TERRESTRIAL, FLUVIAL (MEANDERING), CHANNEL, AND OVERBANK (FLOODPLAIN) DEPOSITIONAL ENVIRONMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THESE FORMATION PICKS USED FOR STRUCTURE AND ISOPACH MAPS.

STRATIGRAPHY: TALLONG CGL Age: CARBONIFEROUS Interpretation Code:Y207

Basal Information: Depth to Base:717 Base Elevation: -698 Thickness: 140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: E. PALAEOZOIC Interpretation Code:Y200
Basal Information: Depth to Base:TD Base Elevation: -778 # Thickness: >60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DURRAS-ULLADULLA

REFERENCE # S124	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	AUST. NAT. UNIV.	COMPOSITE SECTION	SI/56-13	35 22'00"S	150 29'22"E	+15 CA	+15 CA	-475	490 CA	C

REFERENCE: MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page PLATE 2 Publn Year: 1974
Cross Reference: DICKINS, J.M. ET AL., 1969, IN CAMPBELL,K.S.W. (ED) STRATIGRAPHY + PALAEONTOLOGY
, ANU PRESS /// GOSTIN, V.A., 1968, UNPUBL. PH.D THESIS, ANU

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:60 Base Elevation: -45 Thickness: 60
Geologic Description: DK GY SL PBLY + SILTY F SSTS. SLTSTS DOM NEAR TOP. ERRATICS ABND TOWARDS BASE. PROLIFIC MARINE FAUNA IN SLTSTS. CARBONATE CONCRETIONS, GLBND, PY
Reported Environment: QUIET MARINE CONDITIONS WITH ICE-RAFTING (DICKINS ET AL., 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: LOW ANGLE THRUSTS, VERT IG DYKES, SLUMPS
Remarks MARINE FAUNA - PRODUCTIDS, FENESTELLIDS, CRINOIDS. CALLED "ULLADULLA MBST" IN REFS. GEOL.DESCRIPT - DICKINS ET AL., 1969

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:230 Base Elevation: -215 Thickness: 170
Geologic Description: WELL-BDD, QZ-RICH, F SSTS WITH THIN LAYERS C PBLY SST + PBL CGLS. MARINE FOSS + SILTY WORM BURROWS T'OUT. CALCITE, PY, SID CONCRETIONS
Reported Environment: OPEN-MARINE, LITTORAL TO SHALLOW NERITIC CONDITIONS, WITH ONLY A FEW PERIODS OF SHELTERED MARINE SEDIMENTATION (DICKINS ET AL., 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 3-4 (BUT UP TO 11 + 18) DGS EAST
Remarks GEOLOGIC DESCRIPTION - DICKINS ET AL., 1969. THICKNESSES OF SNAPPER POINT, PEBBLEY BEACH & WASP HEAD FMS APPROXIMATE.

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:390 Base Elevation: -375 Thickness: 160
Geologic Description: DK GY SLTST + VF SST WITH THIN BDS PBLS, DIAMICTITE (PBLY SILTY M SST) + ERRATICS. U-SHAPED SCOUR CHANNELS: SLTST, VF SST, COALY STRINGERS
Reported Environment: LOWER PART - RELATIVELY SHALLOW MARINE. UPPER THIRD - SUB-TIDAL AND TIDAL FLAT CONDITIONS (GOSTIN, 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 2-3 DEGREES EAST
Remarks ALSO CONTAINS CARBONATE CONCRETIONS; DISSEM PY, MARINE + PLT FOSS, ORG BURROWS. GEOL. DESCRIPT. - DICKINS ET AL., 1969

STRATIGRAPHY: WASP HEAD FORMATION Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -475 Thickness: 100
Geologic Description: SED BRECCIA UNITS INTBDD WITH + OVERLAIN BY XBDD LI SST WITH THIN BDS CHERT PBL CGL + SILTY F SST WITH THIN PBL CGL BDS; MAR FOSS, WORM BURROWS
Reported Environment: OPEN-MARINE CONDITIONS (I.E. DIRECTLY AFFECTED BY MARINE SWELL). CLOSE TO THE SHORELINE (GEOL. DESCRIPT. + REP. ENVIRON. - DICKINS ET AL., 1969)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DIPS 6 DEGREES ENE
Remarks ALSO CONTAINS NUMEROUS LARGE BOULDERS + PLANT FRAGMENTS. UNCONFORMABLY UNDERLAIN BY LOWER PALAEOZOIC WAGONGA BEDS

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -475 Thickness: 430
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT, PEBBLEY BEACH AND WASP HEAD FORMATIONS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y106

Basal Information: Depth to Base:TD Base Elevation: -475 Thickness: 490
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CONJOLA SUB-GROUP (AS ABOVE) AND WANDRAWANDIAN SILTSTONE

CONTROL POINT : GREENWELL POINT 2

REFERENCE # S112

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
L.H. SMART OIL	WELL	SI/56-9	34 54'40"S	150 43'36"E	+10	+10	-130	140	

REFERENCE: L.H. SMART OIL EXPLORATION CO. LTD
L.H. SMART OIL EXPLORATION CO. LTD. GREENWELL POINT NO.2 WELL, COMPOSITE LOG
UNPUBLISHED Page Publn Year: 1962

Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:
Basal Information: Depth to Base:8 Base Elevation: +2 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:86 Base Elevation: -76 Thickness: 73
Geologic Description: BLUE-BLACK SHALY SILTSTONE AND WHITE, LIGHT GREY, AND DARK GREY SILTSTONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -130 * Thickness: >54
Geologic Description: HARD GY QZITE, HARD GY SHALE, IRON CEMENTED SST, FINE WH SLTST, AND DARK GY DENSE CRINOIDAL SHALY SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -130 * Thickness: >132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP

CONTROL POINT: JERRAWANGALA LOOKOUT

REFERENCE # S121

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	SECTION	SI/56-13	35 10'33"S	150 22'14"E	+490 ?	+490 ?	+290 ?	200	

REFERENCE: MCELROY, C.T., AND ROSE, G.
RECONNAISSANCE GEOLOGICAL SURVEY: ULLADULLA 1-MILE MILITARY SHEET, AND SOUTHERN PART OF TIANJARA 1-MILE MILITARY SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 17 Page 49 Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:48 Base Elevation: +442 Thickness: 48
Geologic Description: MEDIUM-COARSE QUARTZ SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:142 Base Elevation: +348 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +290 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNDERLAIN BY GRANITE. BASE OF SECTION EQUIVALENT TO BASE OF CONJOLA SUB-GROUP

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +290 Thickness: 200
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP

CONTROL POINT: KIRKHAM 1

REFERENCE # S92 Y1
REFERENCE # S92 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-9	34 01'39"S	150 42'27"E	+83	+86	-2476	2562	?

REFERENCE: Y1 RAINE, I.
PETROLOGICAL STUDY OF KIRKHAM (A.O.G.) NO.1 WELL, SYDNEY BASIN, NEW SOUTH WALES
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS RECORD NO. 1969/61 Page Publn Year: 1969
Cross Reference:

REFERENCE: Y2 MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:748 Base Elevation: -662 Thickness: 745
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF WIANAMATTA GP, HAWKESBURY SST AND NARRABEEN GP. THE FOLLOWING INTERPRETATION IS THAT OF THE COMPANY, A.O.G.

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:857 Base Elevation: -771 Thickness: 109
Geologic Description: LT-M GY FINE SUBGREYWACKE, BR-BLK CARB SANDY SLTST, DK GY CARB SLTST, BITUMINOUS BLK COAL, MUDSTONE, COALY MUDSTONE; INTERBEDDED
Reported Environment: RIVER POINT BAR-LEVEE-BACK SWAMP SEQUENCES OF DEPOSITIONAL ENVIRONMENTS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	753	-667	4
COAL INTERVAL	784	-696	12
COAL INTERVAL	811	-725	17
COAL INTERVAL	842	-756	21

Tectonic Structure:
Remarks CALLED "ILLAWARRA CM" IN COMPANY INTERPRETATION. LITHOLOGIC DESCRIPTIONSARE THOSE OF RAINE. EQUIV TO BMR UNITS KM 17-21

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1182 Base Elevation: -1096 Thickness: 325
Geologic Description: SLTST, BR-GY-BLK CARB SANDY SLTST, MDST, COALY MDST, OLIGOMICT CGL, PBLY SUBGWKE, VF-F SUBGWKE (SOME VOLC), PBLY GY-BLK M LI GWKE, BLK BIT COAL
Reported Environment: FLUVIAL AT BASE. VARIETY OF DELTAIC ENVIRONMENTS (PRO-DELTA SLOPE, FORESET, TOP SET). FLUVIAL-PALUDAL AT TOP
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	871	-785	15
COAL	908	-822	3
COAL	982	-896	3
COAL INTERVAL	1182	-1096	72

Tectonic Structure:
Remarks CALLED "CUMBERLAND CM" IN COMPANY INTERP. EQUIV TO BMR UNITS KM 22-27

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1182 Base Elevation: -1096 Thickness: 434
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONSISTS OF SYDNEY AND CUMBERLAND SUB-GROUPS

STRATIGRAPHY: BUDGONG SANDSTONE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1292 Base Elevation: -1206 Thickness: 118
Geologic Description: SL SILTY VF-F VOLC SUBGWKE + ARKOSE, SILTY-CLEAN VF-F SST, BLK-DK GY CARB SLTST, SANDY SLTST; LAMN, SMALL SCALE XBDG, WAVY BDG; FORAMS, BURROWS
Reported Environment: NEAR-SHORE MARINE OR LAGOONAL
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO BMR UNIT KM 28

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1821 Base Elevation: -1735 Thickness: 529
Geologic Description: SANDY SLTST, SILTY VF-M, S'TIMES PBLY, SST (GLAUC IN PLACES), FR-BLK MDST, MINOR CLST; LAMN, WAVY BDG, SMALL SCALE XBG; BRACHIOPODS, PELECYPODS
Reported Environment: MARINE, AT TIMES REDUCING WITH SLOW DEPOSITION. SOME ICE-RAFTING? KEDUMBA CK SST MB - MARINE, PERHAPS A BARRIER BEACH/BAR COMPLEX
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
KEDUMBA CK SST MB 1605 -1519 34
Tectonic Structure:
Remarks EQUIV TO BMR UNITS KM 29-33

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1973 Base Elevation: -1887 Thickness: 152
Geologic Description: LT OLIVE GY SL PBLY F PROTOQZITE-SUBARKOSE, WITH MINOR PBLY M PROTOQZITE + INTBDD SANDY M-C SLTST; SHELL FRAGS; LAMN, WAVY + GRADED BDG, BIOTURB
Reported Environment: MARINE WITH CURRENTS OF FAIRLY UNIFORM STRENGTH. PEBBLES MAY HAVE BEEN RAFTED BY ICE OR TREE ROOTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO BMR UNIT KM 34

STRATIGRAPHY: UNDIFF SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2547 Base Elevation: -2461 Thickness: 574
Geologic Description: INTBDD PBLY F-C PROTOQZITE, SL PBLY SILTY VF SST, SANDY SLTST, SILTY PBLY VF-M PROTOQZITE, SL PBLY M-C SUBGWKE, COAL LAM, CQL; SHELLY FOSSILS
Reported Environment: AT BASE, FLUVIATILE WITH EROSION + REWORKING. OTHERWISE, MARINE. VARIABLE + INTERMITTENT CURRENT ACTIVITY, REDUCING CONDITIONS, ICE RAFTING(?)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO BMR UNITS KM 35-38

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:2547 Base Elevation: -2461 Thickness: 1365
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BUDGONG SST, BERRY SLTST, NOWRA SST AND UNDIFF SHOALHAVEN GP

STRATIGRAPHY: VOLCANICS Age: ? Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -2476# Thickness: >15
Geologic Description: VOLCANIC AGGLOMERATE: AGGLUTINATED BOMBS OF VESICULAR ?ANDESITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIV TO BMR UNIT KM 39

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:749 Base Elevation: -663 Thickness: 746

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1382 Base Elevation: -1216 Thickness: 553
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:2549 Base Elevation: -2462 Thickness: 1246
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DALWOOD GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:TD Base Elevation: -2476# Thickness:)14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MOUNT KEMBLA 1

REFERENCE # S107

Organisation	Type	Mapna	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 27'10"S	150 51'40"E		+348	+270	78	

REFERENCE: JOINT COAL BOARD
BORE LOG OF MOUNT KEMBLA DDH
UNPUBLISHED REPORT PD 64/31 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: +270 ± Thickness:)2
Geologic Description: COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL BULLI SEAM	TD		)2

Tectonic Structure:
Remarks: THIS HOLE ONLY PENETRATED THE BULLI SEAM

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:76 Base Elevation: +272 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

CONTROL POINT : MOUNT MURRAY 1

REFERENCE # S16BY1
REFERENCE # S16BX1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
JOINT COAL BOARD	DDH	SI/56-9	34 38'40"S	150 48'10"E		+539	+159	380	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
JOINT COAL BOARD
BORE LOG OF MOUNT MURRAY NO. 1
UNPUBLISHED REPORT PO 669/51
Page Publn Year: 1951
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:271 Base Elevation: +268 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:272 Base Elevation: +267 Thickness: 0.5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:294 Base Elevation: +245 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
BALGOWNIE COAL MB 279 +260 2
Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:307 Base Elevation: +232 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:315 Base Elevation: +224 Thickness: 7
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:317 Base Elevation: +222 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:323 Base Elevation: +216 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RARGO CLST Age: PERMIAN Interpretatinn Code:X108
Basal Information: Depth to Base:332 Base Elevation: +207 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:339 Base Elevation: +200 Thickness: 7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:361 Base Elevation: +178 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:361 Base Elevation: +178 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALL UNITS BETWEEN 271-361 M

STRATIGRAPHY: ERINS VALE FM Age: PERMIAN Interpretation Code:X112

Basal Information: Depth to Base:TD Base Elevation: +159 * Thickness: >19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:TD Base Elevation: +159 * Thickness: >19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS ERINS VALE FM

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X114
Basal Information: Depth to Base:TD Base Elevation: +159 * Thickness: >109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:270 Base Elevation: +269 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: +159 * Thickness: >110
Geologic Description: COAL, DK GY SHALY SST, F ARG SST, BLK F GR SST, PBLY SST, CARB PY SH, AREN SH, DK GY-BLK MDST, AREN MDST, M-C TUFF, QZITE, BASALT, DOLERITE SILL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL-BULLI SEAM	272	+267	0.5
COAL-"FOUR FEET" SM	279	+260	2
COAL-WONGAWILLI SEAM	307	+232	13
COAL-TONGARRA SEAM	339	+200	6.5

Tectonic Structure:
Remarks

CONTROL POINT: MT. HUNTER 1

REFERENCE # S91 Y1
REFERENCE # S91 Y2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	PDH, CORE + WIRELINE	SI/56-9	34 03'30"S	150 38'50"E	+86	+87	-783	1870	?

REFERENCE: Y1 AUSTRALIAN OIL AND GAS CORP. LTD
AUSTRALIAN OIL AND GAS CORP. LTD, MT. HUNTER NO.1 WELL, SYDNEY BASIN, NSW, WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT (BMR FILE 62/1083) Page Publn Year: 1962
Cross Reference: BMR, 1965, PET. SEARCH SUB. ACTS PUBL. 12

REFERENCE: Y2 WAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149 Page Publn Year: 1974
Cross Reference: RADESKI, A., & JEWELL, F., 1963, BMR RECORD 1963/19

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:643 Base Elevation: -556 Thickness: 642
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:1017 Base Elevation: -930 Thickness: 374
Geologic Description: INTBDD COAL, BL GY-BLK SILTY SH, DK GY-BLK CARB SH, GY M-F SST, GY SLTST, CGL SST, C-F PBL CGL, AND MINOR GY-WH + BUFF-CREAM CHERTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	649	-562	5.5
COAL	718	-631	2.1
COAL	740	-653	1.5
COALY, CARB SH INT	1017	-930	65

Tectonic Structure:
Remarks EQUIVALENT TO LITHGOW CM? AND TOMAGO FM? OF COMPLETION REPORT. 1.2 M COAL SEAMS AT -581 (668 M) AND -697 (784 M)

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -983 # Thickness: >53
Geologic Description: GREY, FINE-COARSE GRAINED, CALCAREOUS SANDSTONE WITH THIN LIMESTONE BANDS. MINOR DARK GREY SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CAPERTEE GROUP IN COMPLETION REPORT

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:641 Base Elevation: -554 Thickness: 640
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202

Basal Information: Depth to Base:976 Base Elevation: -889 Thickness: 335
Geologic Description:
Reported Environment: FLUVIAL-DELTAIC
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:TD Base Elevation: -983 * Thickness:)94
Geologic Description:
Reported Environment: LOW ENERGY MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: NATIONAL PARK (SC) 2

REFERENCE # 597

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	DDH	SI/56-9	34 07'11"S	151 00'28"E		+198	-399	597	

REFERENCE: JOINT COAL BOARD
BORE LOG OF NATIONAL PARK (STATE COLLIERY) DDH 2
UNPUBLISHED REPORT PO 64/27 Page Publn Year: 1964

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:557 Base Elevation: -359 Thickness: 557
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -399 # Thickness:)40
Geologic Description: COAL, DARK SHALE, SANDSTONE, FINE CONGLOMERATE AND CHERT
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL-BULLI SEAM	558	-360	1
COAL-BALGOWNIE SEAM	580	-382	1.7

Tectonic Structure:
Remarks

CONTROL POINT: PEBBLEY BEACH

REFERENCE # S124 C

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. NAT. UNIV.	SECTION	SI/56-13	35 36'20"S	150 20'30"E	+5 ?	+5 ?	-155 ?	160 CA	#

REFERENCE: COSTIN, V.A.
STRATIGRAPHY AND SEDIMENTOLOGY OF THE LOWER PERMIAN SEQUENCE IN THE DURRAS-ULLADULLA AREA, SYDNEY BASIN, NEW SOUTH WALES
UNPUBLISHED PH.D. THESIS, AUSTRALIAN NATIONAL UNIVERSITY Page Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -155 Thickness: 160
Geologic Description: SEE DURRAS-ULLADULLA COMPOSITE SECTION. REFERENCE ELEVATION QUOTED ABOVE IS APPROXIMATE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: REPRESENTS COASTAL SECTIONS ON WASP ISLAND AND FROM DURRAS NORTH TO BASE OF CLEAR POINT. OVERLAIN BY SNAPPER POINT FM

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -155 # Thickness:)160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF PEBBLEY BEACH FM. THICKNESS OF PEBBLEY BEACH FM APPROXIMATE.

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -155 # Thickness:)160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF PEBBLEY BEACH FM OF CONJOLA SUB-GROUP

CONTROL POINT: PIGEON HOUSE

REFERENCE # S123

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	SECTION	SI/56-13	35 21'07"S	150 15'43"E	+719	+719	+386	333	

REFERENCE: MCELROY, C.T., AND ROSE, G.
RECONNAISSANCE GEOLOGICAL SURVEY: ULLADULLA 1-MILE MILITARY SHEET, AND SOUTHERN PART OF TIANJARA 1-MILE MILITARY SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 17 Page Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:79 Base Elevation: +640 Thickness: 79
Geologic Description: MEDIUM-COARSE QUARTZ SANDSTONE CONTAINING NUMEROUS GRANULES + PEBBLES OF QUARTZ. SOME SILTY BANDS THROUGHOUT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:201 Base Elevation: +518 Thickness: 122
Geologic Description: M-C, PEBBLY QZ SST, FINE SST, QZ SLTST, AND GY, MICAC SLTST WITH MUD SWIRLS AND SCATTERED QZ + QZITE PEBBLES; ABUNDANT PELECYPOD + SPIRIFER FOSS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:282 Base Elevation: +437 Thickness: 81
Geologic Description: FINE, LT GREY, MICAC QUARTZ SANDSTONE WITH MUD SWIRLS, COARSE, QUARTZ-FELDSPATHIC, PEBBLY SANDSTONE, AND WHITE SHALY SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:282 Base Elevation: +437 Thickness: 282
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP

STRATIGRAPHY: YADDORO CONGLOMERATE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:329 Base Elevation: +390 Thickness: 47
Geologic Description: CONGLOMERATE, WITH SMALL LENSES OF GREY SHALE AND SANDY BANDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLYDE COAL MEASURES Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: +386 Thickness: 4

Geologic Description: DK GREY CARBONACEOUS SHALE, COALY IN PART, AND LIGHT GREY, MEDIUM-COARSE GRAINED, CARBONACEOUS, MASSIVE, QUARTZ-FELDSPATHIC SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TD REPRESENTS BASE OF CLYDE COAL MEASURES. IMMEDIATELY, UNCONFORMABLY UNDERLAIN BY OLDER PALAEOZOIC

CONTROL POINT: POINTER GAP

REFERENCE # S122

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. NAT. UNIV.	SECTION	SI/56-13	35 15'50"S	150 21'21"E	+480	+480	+40	440	CA

REFERENCE: DICKINS, J.M., COSTIN, V.A., AND RUNNEGAR, B.
THE AGE OF THE PERMIAN SEQUENCE IN THE SOUTHERN PART OF THE SYDNEY BASIN
IN K.S.W. CAMPBELL (ED.), STRATIGRAPHY + PALAEONTOLOGY, ANU PRESS Page 211-225 Publn Year: 1969

Cross Reference: COSTIN, V.A., 1968, UNPUBL. PH.D. THESIS, AUST. NAT. UNIV.

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Yi01
Basal Information: Depth to Base:47 Base Elevation: +433 Thickness: 47
Geologic Description:
Reported Environment: DEPOSITED AS TABULAR BODY OF SST DURING A TRANSGRESSION IN ENVIRONMENT OF HIGH TURBULENCE + SOME STRONG CURRENTS. SOME ICE-FLOES (COSTIN, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASAL PART OF NOWRA SANDSTONE YIELDS AN ABUNDANT WELL-PRESERVED FAUNA (NEAR TOP OF POINTER GAP ROAD)

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Yi02
Basal Information: Depth to Base:182 Base Elevation: +298 Thickness: 135
Geologic Description:
Reported Environment: DEPOSITION PROBABLY OCCURRED ON A SHALLOW MARINE SHELF BENEATH A COVER OF ICE-FLOES (COSTIN, 1968, 28)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UPPERMOST PART OF WANDRAWANDIAN SILTSTONE YIELDS AN ABUNDANT WELL-PRESERVED FAUNA (NEAR TOP OF POINTER GAP ROAD)

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Yi03
Basal Information: Depth to Base:TD Base Elevation: +40 ± Thickness: 258
Geologic Description: CONJOLA CREEK - SLIGHTLY PEBBLY, COARSE GRAINED SANDSTONE CONTAINING NUMEROUS MARINE FOSSILS
Reported Environment: SHALLOW-MODERATE DEPTH MARINE TO SUB-TIDAL (COSTIN, 1968, FIG. 2-6)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks AT CONJOLA CK ON PRINCES HIGHWAY, CONJOLA SUB-GROUP UNCONFORMABLY OVERLIES ORDOVICIAN ARGILLITES INTRUDED BY A GRANITE

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Yi04
Basal Information: Depth to Base:TD Base Elevation: +40 ± Thickness: 440
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE + CONJOLA SUB-GROUP

CONTROL POINT: PT. PERPENDICULAR 1

REFERENCE # S116Y1
REFERENCE # S116Y2

Organisation	Type	Mapno	Lat	Long	Surf El Ref El	Bot El	T.Dpth	status code
L.H. SMART OIL	WELL	SI/56-13	35 03'48"S	150 48'50"E	+73	-104	177	?

REFERENCE: Y1 L.H. SMART OIL EXPLORATION CO. LTD
L.H. SMART OIL EXPLORATION CO. LTD, PT. PERPENDICULAR NO.1, COMPOSITE LOG
UNPUBLISHED Page Publn Year: 1962
Cross Reference:

REFERENCE: Y2 BEMBRICK, C.S., AND HOLMES, G.G.
AN INTERPRETATION OF THE SUBSURFACE GEOLOGY OF THE NOWRA-JERVIS BAY AREA
GEOLOGICAL SURVEY OF NEW SOUTH WALES RECORD 18 (1) Page 5-68 Publn Year: 1976
Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:3 Base Elevation: +70 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -104 # Thickness:)177
Geologic Description: HARD GY SH, PBLY SANDY SH, WH-GY SANDY SLTST, DK GY SLTST, PBLY SILTY SST, F-C GY SILTY SST, F GK WH SST, C PBLY SST, FELDSPATHIC GRIT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT + PEBBLEY BEACH FORMATIONS.

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -104 # Thickness:)177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CONJOLA SUB-GROUP AS ABOVE

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y201
Basal Information: Depth to Base:125 Base Elevation: -52 Thickness: 125
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:TD Base Elevation: -104 # Thickness:)52
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code: Y204
Basal Information: Depth to Base: TD Base Elevation: -104 * Thickness:)174
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CONJOLA SUB-GROUP

CONTROL POINT: SNAPPER POINT

REFERENCE # S124 B

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. NAT. UNIV.	SECTION	SI/56-13	35 30'10"S	150 23'30"E	+5	? +5 ?	-165 ?	170	CA *

REFERENCE: GOSTIN, V.A.
STRATIGRAPHY AND SEDIMENTOLOGY OF THE LOWER PERMIAN SEQUENCE IN THE DURRAS-ULLADULLA AREA, SYDNEY BASIN, NEW SOUTH WALES
UNPUBLISHED PH.D. THESIS, AUSTRALIAN NATIONAL UNIVERSITY Page Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:TD Base Elevation: -165 Thickness: 170
Geologic Description: SEE DURRAS-ULLADULLA COMPOSITE SECTION. REFERENCE ELEVATION QUOTED ABOVE IS APPROXIMATE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS COASTAL SECTIONS FROM CLEAR POINT TO SNAPPER POINT AND WILLINGA POINT TO CRAMPTON ISLAND. THICKNESS APPROXIMA

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -165 * Thickness: >170
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -165 * Thickness: >170
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER POINT FM OF CONJOLA SUB-GROUP

CONTROL POINT: STOCKYARD MOUNTAIN 1

REFERENCE # 5109

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FARMOUT DRILLERS	WELL, CORE+WIRELINE	SI/56-9	34 35'41"S	150 46'53"E	+50	+53	-1019	1072	

REFERENCE: HARE, R., AND ASSOCIATES
FARMOUT DRILLERS N.L. STOCKYARD MOUNTAIN WELL NO.1, N.S.W., WELL COMPLETION REPORT
UNPUBLISHED WELL COMPLETION REPORT, BMR FILE NO. 62/1114 Page Publn Year: 1963

Cross Reference: ALCOCK, P.J., 1968 BMR RECORD 1968/31 // BMR, 1965, PET. SEARCH SUB. ACTS PUBLN. 12 // MAYNE, S.J., ET AL., 1974, BMR BULLETIN 149

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:5 Base Elevation: +48 Thickness: 2
Geologic Description: ALLUVIUM AND SCREE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GERRINGONG VOLCANICS Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:14 Base Elevation: +39 Thickness: 9
Geologic Description: BR, FINE GRAINED TUFF WITH FRAGS OF DK GY TUFF, BR CHERT, DK GY BASALT AND TRACES OF LT GY FINE GRAINED QUARTZ SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: EQUIVALENT TO S1 DIVISION OF ALCOCK, 1968

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:491 Base Elevation: -438 Thickness: 477
Geologic Description: DK GY SILTY SH + GY F SL ARG SLTST BOTH WITH TRACE MICA RARE PY CARB SPECKS, LT-M GY + LT BR F-M QZ SST, DOL IN PARTS; SOME INTBDG; MINOR VOLCS
Reported Environment: QUIET SHALLOW MARINE OR DEEP MARINE SUBJECT TO GENTLE CURRENT ACTION; ACTIVE BASALTIC VOLCANISM (ALCOCK, 1968)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASALT + RHYOLITE	381	-328	65

Tectonic Structure:
Remarks: THIS UNIT CONTAINS MARINE FOSSILS - BIVALVES, BRACHIOPODS, BRYOZOANS AND WORM BURROWS. EQUIV TO S2-5 (ALCOCK, 1968)

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:629 Base Elevation: -576 Thickness: 138
Geologic Description: LT GY-WH, F-VC GR, SILICEOUS SST (KAOL + V SL CALC IN PLACES) + M GY-BR, F GR, ARG SST; INTBDS OF SH IN UPPER PART; CORAL + PELECYPOD FOSSILS
Reported Environment: AGITATED MARINE WATER (SHALLOW, NEAR-SHORE) WITH INTERMITTENT LOW ENERGY CONDITIONS (ALCOCK, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:777 Base Elevation: -724 Thickness: 148
Geologic Description: INTBDD M-LT GY-BR, F GR, GEN SILIC SST, DK BR-BLK CARB, SILTY, AREN, MICAC SH + GY-BR-BLK ARG, TFAC SLTST; MINOR FOSSILIFEROUS LST; MARINE FOSS
Reported Environment: TOP PART - INTERMITTENTLY QUIET AND AGITATED MARINE WATERS. LOWER PART - A VARIETY OF NEAR-SHORE MARINE ENVIRONMENTS (ALCOCK, 1968)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y186
Basal Information: Depth to Base:1065 Base Elevation: -952 Thickness: 228
Geologic Description: INTBDD BAS-ANDES ROCKS + TFAC CLST, LT GY SILIC SST, M-DK GY ARG TFAC CARB SLTST, BLK CARB SH, MINOR BOL, CGL SST, QZITE, COAL; PBL-CBL CGL BASE
Reported Environment: TOP PART - QUIET + AGITATED WATER WITH PERIODIC VOLC ACTIVITY. LOWER PART - ALT QUIET AND AGITATED CONDITIONS; AT TIMES RESTRICTED (ALCOCK 1968)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BASAL CONGLOMERATE	1005	-952	13

Tectonic Structure:
Remarks: CONSISTS OF CONJOLA FM + BASAL CONGLOMERATE OF WELL COMPLETION REPORT

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y187
Basal Information: Depth to Base:1005 Base Elevation: -952 Thickness: 1000
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONSISTS OF GERRINGONG VOLCS, BERRY SLTST, NOWRA SST, WANDRAWANDIAN SLTST, AND CONJOLA SUB-GROUP

STRATIGRAPHY: SEDIMENTS Age: DEVONIAN? Interpretation Code:Y128
Basal Information: Depth to Base:TD Base Elevation: -1019* Thickness: >67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

CONTROL POINT: TOMERONG-NERRIGA RD

REFERENCE # S119

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	SECTION	SI/56-13	35 05'15"S	150 08'02"E	+732	+732	+623	109	

REFERENCE: MCELROY, C.T., AND ROSE, G.
RECONNAISSANCE GEOLOGICAL SURVEY: ULLADULLA 1-MILE MILITARY SHEET, AND SOUTHERN PART OF TIANJARA 1-MILE MILITARY SHEET
GEOLOGICAL SURVEY OF NEW SOUTH WALES BULLETIN NO. 17 Page 58 Publn Year: 1962

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:49 Base Elevation: +683 Thickness: 49
Geologic Description: F-M PEBBLY QZ SST (MUD SWIRLS T'OUT), BASAL CONGLOMERATE WITH QZ, QZITE, CHERT, PHYLLITE AND GREYWACKE PEBBLES + OCCASIONAL BOULDERS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:77 Base Elevation: +655 Thickness: 28
Geologic Description: GREY MICACEOUS SILTSTONE, SHALY IN PART WITH OCCASIONAL QZ + QZITE PEBBLES. FINE SANDSTONE AT TOP. WELL DEFINED BEDDING
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +623 Thickness: 32
Geologic Description: INTERBEDDED FINE-COARSE, QUARTZ, LITHIC, MICACEOUS SANDSTONE WITH SOME MUD SWIRLS, AND CONGLOMERATE WITH QUARTZ + QUARTZITE PEBBLES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNDERLAIN BY UPPER ORDOVICIAN. BASE OF SECTION EQUIVALENT TO BASE OF CONJOLA SUB-GROUP

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +623 Thickness: 109
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP

CONTROL POINT: ULLADULLA

REFERENCE # S124 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. NAT. UNIV.	SECTION	SI/56-13	35 22'00"S	150 29'[illegible]	+15 CA	+15 CA	-45	60 CA	47

REFERENCE: GOSTIN, V.A.
STRATIGRAPHY AND SEDIMENTOLOGY OF THE LOWER PERMIAN SEQUENCE IN THE DURRAS-ULLADULLA AREA, SYDNEY BASIN, NEW SOUTH WALES
UNPUBLISHED PH.D. THESIS, AUSTRALIAN NATIONAL UNIVERSITY Page Publn Year: 1968

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code: Yi61
Basal Information: Depth to Base: TD Base Elevation: -45 Thickness: 60
Geologic Description: SEE DURRAS-ULLADULLA COMPOSITE SECTION. REPRESENTS COASTAL SECTIONS FROM WAIRO BEACH TO WARDEN HEAD AND MOLLYHOOK
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED "ULLADULLA MUDSTONE" BY GOSTIN. UNDERLAIN BY SHAPPER POINT FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code: Yi62
Basal Information: Depth to Base: TD Base Elevation: -45 ± Thickness: >60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF WANDRAWANDIAN SILTSTONE

CONTROL POINT: ULLADULLA 1

REFERENCE # S117

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BUR. MIN. RES.	DDH, CORE + WIRELINE	SI/56-13	35 09'12"S	150 43'35"E	+87	+87	-22	189	

REFERENCE: JACKSON, M.J.
STRATIGRAPHIC BORES BMR ULLADULLA 1 AND 2, AND IMPLICATIONS FOR ENGINEERING GEOLOGY, JERVIS BAY, A.C.T.
BUREAU OF MINERAL RESOURCES RECORD NO. 1970/45 Page Publn Year: 1970

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: QUATERNARY SAND Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:21 Base Elevation: +66 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:TD Base Elevation: -22 * Thickness:)88
Geologic Description: MASS BDD, M-C, DK GY, FLD GWKE, THINLY BDD, M GR, LT GY, FLD SST, M GR ARENITE WITH BLK CLAY STRINGERS + V ARG MATRIX, MINOR CGL, SH, ORTHOQZITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -22 * Thickness:)88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF CONJOLA SUB-GROUP, AS ABOVE

CONTROL POINT : WANDRAWANDIAN BORE

REFERENCE # S118

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
J. MACLEAN + CO.	DDH	SI/56-13	35 03'08"S	150 29'20"E	+180 ?	+180 ?	-254 ?	434	

REFERENCE: BEMBRICK, C.S., AND HOLMES, G.G.
AN INTERPRETATION OF THE SUBSURFACE GEOLOGY OF THE NOWRA-JERVIS BAY AREA
GEOLOGICAL SURVEY OF NEW SOUTH WALES RECORD 18 (1) Page 5-68 Publn Year: 1976
Cross Reference: HARPER, L.F., 1915, GEOL. SURV. N.S.W. MEM. 7, P.261

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:48 Base Elevation: +132 Thickness: 48
Geologic Description: HARD CONGLOMERATE, SOFT CHERT AND FIRECLAY. (HARPER, 1915, P.261)
Reported Environment: NEAR-SHORE TO DEEPER MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: REPORTED ENVIRONMENTS QUOTED HEREIN APPLY TO THE FORMATION IN GENERAL IN THE NOWRA-JERVIS BAY AREA

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:180 Base Elevation: 0 Thickness: 132
Geologic Description: FIRECLAY, BLUE "POST", HARD, BLUE "POST", CHERT, AND CONGLOMERATE; INTERBEDDED. (HARPER, 1915, P.261)
Reported Environment: MODERATLEY DEEP SHELF IN GENERAL PROTECTED FROM CONTINUOUS WAVE ACTIVITY. POSSIBLE ICE-RAFTED PEBBLES AND CLASTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:259 Base Elevation: -79 Thickness: 79
Geologic Description: SANDSTONE, BLUE "POST", AND CONGLOMERATE; INTERBEDDED. (HARPER, 1915, P.261)
Reported Environment: SHALLOW MARINE, HIGH ENERGY ENVIRONMENT ABOVE WAVE BASE. SOME DEPOSITION IN SUB-TIDAL + SHELTERED ENVIRONMENT + SOME DEPOSITION FROM ICE-FLOES
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: PEBBLEY BEACH FM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:406 Base Elevation: -226 Thickness: 147
Geologic Description: CONGLOMERATE, BLUE "POST", HARD, BLUE "POST", SANDSTONE, BLUE SANDSTONE; INTERBEDDED (HARPER, 1915, P.261)
Reported Environment: LOWER 2/3 - SHALLOW SHELF WITH FLOATING ICE DAMPENING WAVES + REDUCING EFFECTIVE WAVE BASE; ICE-RAFTING. UPPER 1/3 - SUBTIDAL + TIDAL FLATS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:406 Base Elevation: -226 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONSISTS OF PEBBLEY BEACH AND SNAPPER POINT FORMATIONS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:406 Base Elevation: -226 Thickness: 406

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF NOWRA SANDSTONE, WANDRAWANDIAN SILTSTONE AND CONJOLA SUB-GROUP (AS ABOVE)

STRATIGRAPHY: YARRUNGA CM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:431 Base Elevation: -251 Thickness: 25
Geologic Description: COAL SEAMS, SANDSTONE, CONGLOMERATE, AND SANDY, PYRITIC SHALE. (HARPER 1915, P.261)
Reported Environment: TERRESTRIAL: FLUVIAL (MEANDERING), CHANNEL, AND OVERBANK (FLOODPLAIN) DEPOSITIONAL ENVIRONMENTS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: E. PALAEOZOIC Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -274 # Thickness:)3
Geologic Description: UNDIFFERENTIATED METAMORPHOSED SEDIMENTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WASP HEAD

REFERENCE # S124 D

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. NAT. UNIV.	SECTION	SI/56-13	35 40'15"S	150 18'20"E	0 CA	0 CA	-100	100 CA	*

REFERENCE: GOSTIN, V.A.
STRATIGRAPHY AND SEDIMENTOLOGY OF THE LOWER PERMIAN SEQUENCE IN THE DURRAS-ULLADULLA AREA, SYDNEY BASIN, NEW SOUTH WALES
UNPUBLISHED PH.D. THESIS, AUSTRALIAN NATIONAL UNIVERSITY Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: WASP HEAD FORMATION Age: PERMIAN Interpretation Code: **Y101**
Basal Information: Depth to Base:TD Base Elevation: -100 Thickness: 100
Geologic Description: SEE DURRAS-ULLADULLA COMPOSITE SECTION. REPRESENTS COASTAL SECTIONS FROM MYRTLE BEACH TO WASP HEAD, SOUTH DURRAS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IMMEDIATELY, UNCONFORMABLY UNDERLAIN BY ORDOVICIAN WAGONGA BEDS. OVERLAIN BY PEBBLEY BEACH FM. THICKNESS APPROXIMATE

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code: **Y102**
Basal Information: Depth to Base:TD Base Elevation: -100 * Thickness: >100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WASP HEAD FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code: **Y103**
Basal Information: Depth to Base:TD Base Elevation: -100 * Thickness: >100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WASP HEAD FM OF CONJOLA SUB-GROUP

CONTROL POINT: WORONORA 1

REFERENCE # S98 Y1
REFERENCE # S98 Y2
REFERENCE # S98 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. OIL & GAS	WELL, CORE+WIRELINE	SI/56-9	34 11'40"S	150 54'50"E	+354	+357	-1956	2311	?

REFERENCE: X1
THIS REPORT
Page
Publn Year:
Cross Reference:

REFERENCE: Y1
ALCOCK, P.J.
PETROLOGICAL STUDY OF WORONORA (A.O.G.) NO.1 WELL, SYDNEY BASIN, NEW SOUTH WALES
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS RECORD NO. 1968/58
Page
Publn Year: 1968
Cross Reference:

REFERENCE: Y2
MAYNE, S.J., NICHOLAS, E., BIGG-WITHER, A.L., RASIDI, J.S., AND RAINE, M.J.
GEOLOGY OF THE SYDNEY BASIN - A REVIEW
BUREAU OF MINERAL RESOURCES BULLETIN 149
Page
Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:521 Base Elevation: -164 Thickness: 518
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:687 Base Elevation: -330 Thickness:
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:753 Base Elevation: -396 Thickness: 232
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES DARKES FOREST SST

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1141 Base Elevation: -784 Thickness: 388
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1141 Base Elevation: -784 Thickness: 620
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF ILLAWARRA CM IS UNCERTAIN, AS THE MARINE TO TERRESTRIAL SEQUENCE IS TRANSITIONAL

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2278 Base Elevation: -1921 Thickness: 1137
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1956* Thickness: >35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:521 Base Elevation: -164 Thickness: 518
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF HAWKESBURY SST AND NARRABEEN GP. THE FOLLOWING STRATIGRAPHIC INTERPRETATION IS THAT OF THE COMPANY, A.O.G.

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:671 Base Elevation: -314 Thickness: 150
Geologic Description: COAL (BLK, VITR OR DULL, SILTY), CARB SH, CARB SLTST, AND MINOR LITHIC SST, CHERT-RICH PROTOQZITE + ANDESITIC VOLCS; SOME LAMN; PLANT REMAINS
Reported Environment: SWAMP CONDITIONS TO QUIET WATER IN CONTINENTAL ENVIRONMENT, E.G. LAKE FED BY SLUGGISH STREAMS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	530	-173	8
COAL	611	-254	1
COAL	661	-314	2

Tectonic Structure:
Remarks CALLED ILLAWARRA CM BY ALCOCK. APPROX EQUIV TO BMR UNITS W15-17

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1042 Base Elevation: -685 Thickness: 371
Geologic Description: COAL, QZ-RICH SST, LITHIC GWKE, VOLC SUBGWKE, SHALE, CARB SHALE, MUDSTONE, SLTST, AND F GR CHERT-RICH PROTOQZITE; SOME SLTST LAMD; PLANT REMAINS
Reported Environment: QUIET WATER (LAGOON, LAKE OR FLOODPLAIN) ENVIRONMENT. AT BASE, PARTLY SWAMPY, PARTLY FLUVIAL ENVIRONMENT
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	722	-365	2
COAL INTERVAL	864	-507	11
COAL INTERVAL	1042	-685	159

Tectonic Structure:
Remarks CALLED CUMBERLAND CM BY ALCOCK. EQUIVALENT TO BMR UNITS W17-21. NUMEROUS THIN SEAMS IN LOWEST COAL INTERVAL.

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1042 Base Elevation: -685 Thickness: 521
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SYDNEY AND CUMBERLAND SUB-GROUPS

STRATIGRAPHY: BUDGONG SANDSTONE Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1210 Base Elevation: -853 Thickness: 168
Geologic Description: DOLOMITIC VOLC-RICH SUBGWKE, DOLOMITIC PROTOQZITE, AND MINOR CARB SH, SLTST AND COAL; BURROWING, BIOTURB, SOME XBDG, SHELL REMAINS AT BASE
Reported Environment: RESTRICTED MARINE AT BASE, AT TOP, COASTAL PLAIN-ESTUARINE (FLUVIAL, TIDAL AND SWAMPY CONDITIONS)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks APPROX EQUIVALENT TO BMR UNITS W22-23

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1731 Base Elevation: -1374 Thickness: 521
Geologic Description: SANDY, MICAC SLTST, SLTST, F GR PROTOQZITE, SHALE, F GR SUBGWKE, F LITHIC GWKE, QZ-RICH SST, AND MUDSTONE; SOME LAMN, XLAMN, RIPPLE MARKS, FOSS
Reported Environment: IN GENERAL, QUIET, LOW ENERGY MARINE. KEDUMBA CREEK SST MB - HIGHER ENERGY MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
KEDUMBA CK SST MB 1603 -1246 47
Tectonic Structure:
Remarks APPROX EQUIVALENT TO BMR UNITS W24-31. KEDUMBA CK SST MB EQUIV TO BMR UNITS W29-30

STRATIGRAPHY: NOWRA SANDSTONE Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1885 Base Elevation: -1528 Thickness: 154
Geologic Description: INTBDD ORTHOQUARTZITE-PROTOQUARTZITE + FELDSPATHIC SST, F LITHIC SST, SANDY SLTST + VOLCANIC SUBGREYWACKE; LOW ANGLE CROSS-BEDDING
Reported Environment: NEARSHORE OR CONTINENTAL (AGITATED FLOWING WATER) AT BASE AND LOW ENERGY CONDITIONS AT TOP
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNITS W32-33

STRATIGRAPHY: WANDRAWANDIAN SLTST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:2230 Base Elevation: -1873 Thickness: 345
Geologic Description: INTBDD PROTOQZITE, F SUBGWKE, GREY SANDY SLTST, FELDSPATHIC SST, QZ GWKE, QZ-RICH SST; CARB FRAGMENTS (SOME COAL), BIOTURB, MARINE FOSSILS
Reported Environment: GENERALLY LOW ENERGY MARINE, AT TIMES HIGHER ENERGY
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNITS W34-39

STRATIGRAPHY: SNAPPER POINT FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:2278 Base Elevation: -1921 Thickness: 48
Geologic Description: PROTOQUARTZITE + FELDSPATHIC SST. SOME PEBBLY HORIZONS + SILTSTONE BEDS, RARE SPINES AND (?)FORAMINIFERA
Reported Environment: MARINE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO BMR UNIT W40

STRATIGRAPHY: CONJOLA SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:2278 Base Elevation: -1921 Thickness: 48
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF SNAPPER PT. FM

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:2278 Base Elevation: -1921 Thickness: 1236
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BUDGONG SST - CONJOLA SUB-GROUP

STRATIGRAPHY: BASEMENT Age: CARBONIFEROUS?Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1956* Thickness: >35
Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y201
Basal Information: Depth to Base:512 Base Elevation: -155 Thickness: 509
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1190 Base Elevation: -833 Thickness: 678
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:2280 Base Elevation: -1923 Thickness: 1090
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: CARBONIFEROUS?Interpretation Code:Y204
Basal Information: Depth to Base:TD Base Elevation: -1956* Thickness: >33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YARRUNGA CREEK

REFERENCE # S111

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	SECTION	SI/56-9	34 44'36"S	150 22'21"E	+40	+40	+25		

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: GRAY, N.M., 1969, ABSTR. 3RD NEWCASTLE SYMPOSIUM, 42-43 /// HERBERT, C., 1980, I N HERBERT & HELBY, 1980, GEOL. SURV. N.S.W. BULL. 26, 89 & 92

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: YARRUNGA CM Age: PERMIAN Interpretation Code:X101

Basal Information: Depth to Base: Base Elevation: +25 Thickness: 15

Geologic Description:

Reported Environment:

Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:

Remarks: EQUIV TO GRETA CM & LOWER BRANXTON FM UNDERLIES SNAPPER POINT FM & OVERLIES BURRAWANG CGL & DEVONIAN BASEMENT

CONTROL POINT: YERRINBOOL 1

REFERENCE # S103Y1
REFERENCE # S103X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
OIL PROS. SYHD.	DDH	SI/56-9	34 23'18"S	150 31'18"E		+516	-166	682	?

REFERENCE: X1 THIS REPORT

Cross Reference: MAYNE, S.J., ET AL., 1974, BUR. MIN. RES. BULLETIN 149 Page: Publn Year:

REFERENCE: Y1 JOINT COAL BOARD
BORE LOG OF YERRINBOOL D.D.H.
UNPUBLISHED REPORT PD 66/172

Cross Reference: Page: Publn Year: 1966

SEDIMENTARY BASIN: SYDNEY, SOUTH

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:269 Base Elevation: +247 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BULLI COAL Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:270 Base Elevation: +246 Thickness: 1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ECKERSLEY FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:281 Base Elevation: +235 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WONGAWILLI COAL Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:287 Base Elevation: +229 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KEMBLA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:294 Base Elevation: +222 Thickness: 7
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLANS CREEK FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:308 Base Elevation: +208 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARKES FOREST SST Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:317 Base Elevation: +199 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BARGO CLST Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:319 Base Elevation: +197 Thickness: 2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TONGARRA COAL Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:320 Base Elevation: +196 Thickness: 1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WILTON FM Age: PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:338 Base Elevation: +178 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SYDNEY SUB-GP Age: PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:338 Base Elevation: +178 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS ALL UNITS BETWEEN 269-338 M

STRATIGRAPHY: CUMBERLAND SUB-GP Age: PERMIAN Interpretation Code:X112
Basal Information: Depth to Base:362 Base Elevation: +154 Thickness: 24

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:X113
Basal Information: Depth to Base:362 Base Elevation: +154 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS SYDNEY & CUMBERLAND SUB-GROUPS

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:X114
Basal Information: Depth to Base:TD Base Elevation: -166 * Thickness:)320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:269 Base Elevation: +247 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ILLAWARRA CM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:362 Base Elevation: +154 Thickness: 93
Geologic Description: COAL, STONY COAL, GREY-DK GREY SHALE, CARBONACEOUS SHALE, SANDSTONE, SHALY SANDSTONE AND CHERT
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL-BULLI SEAM	270	+246	1
COAL-WONGAWILLI SEAM	287	+229	6
COAL-TONGARRA SEAM	320	+196	1

Tectonic Structure:
Remarks

STRATIGRAPHY: BERRY SILTSTONE Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -166 * Thickness:)321
Geologic Description: SANDSTONE, OCCASIONALLY PEBBLY FINE SANDSTONE, CHERT. MARINE FOSSILS (SHELLS)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED CAPERTEE GROUP IN REFERENCE

STRATIGRAPHY: SHOALHAVEN GP Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -166 * Thickness:)321
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BERRY SILTSTONE

OAKLANDS

BASIN

CONTROL POINT: OAKLANDS RDH 11

REFERENCE # K7	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	NSW DEPT MINES	RDH, CORE + WIRELINE	SI/55-14	35 40'17"S	146 03'35"E		+125	-1	126	

REFERENCE: THIS REPORT — Page — Publn Year:

Cross Reference: PALESE, G.W., 1974, GEOL. SURV. N.S.W. REPORT GS 1974/090

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:99 Base Elevation: +26 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COOKABIN CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:113 Base Elevation: +12 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -1 * Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : OAKLANDS RDH 13

REFERENCE # KA

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
NSW DEPT MINES	RDH, CORE + WIRELINE	SI/55-14	35 38'04"S	146 05'34"E		+125	-4	129	

REFERENCE: THIS REPORT

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Cross Reference: PALESE, G.W., 1974, GEOL. SURV. N.S.W. REPORT GS 1974/098

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:103 Base Elevation: +22 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COORABIN CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:117 Base Elevation: +8 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -4 * Thickness:)12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: OAKLANDS RDH 17

REFERENCE # K5

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	RDH, CORE + WIRELINE	SI/55-14	35 28'23"S	146 04'34"E		+119	-83	202	

REFERENCE:

THIS REPORT

Page Publn Year:

Cross Reference: PALESE, G.W., 1974, GEOL. SURV. N.S.W. REPORT GS 1974/090

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:158 Base Elevation: -39 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COOKABIN CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:TD Base Elevation: -83 * Thickness:)44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: OAKLANDS RDH 18

REFERENCE # K3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	RDH, CORE + WIRELINE	SI/55-14	35 25'22"S	145 50'08"E		+83	-204	287	

REFERENCE:

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Page Publn Year:

Cross Reference: PALESE, G.M., 1974, GEOL. SURV. N.S.W. REPORT GS 1974/098

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:262 Base Elevation: -179 Thickness: 262
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COOKABIN CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:TD Base Elevation: -204 # Thickness:)25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: OAKLANDS RDH 2

REFERENCE # K4

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
NSW DEPT MINES	RDH, CORE + WIRELINE	SI/55-14	35 27'13"S	145 59'00"E		+118	-193	311	

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: PALE[illegible]G.W., 1974, GEOL. SURV. N.S.W. REPORT GS 1974/090

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:271 Base Elevation: -153 Thickness: 271
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COORABIN CM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:TD Base Elevation: -193 # Thickness:)40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WALOONA CDH 1

REFERENCE # K1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	CDH, FULLY CORED	SI/55-10	34 51'28"S	145 42'21"E		+114	-263	377	

REFERENCE: YOO, E.K.
MURRAY INFRABASIN DRILLING PROGRAMME - THE NORTHERN PART OF THE OAKLANDS BASIN
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1981/155 (UNPUBLISHED) Page Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:211 Base Elevation: -97 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERILDERIE FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:306 Base Elevation: -192 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COORABIN CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:336 Base Elevation: -222 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -263 * Thickness: >41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YANKO SOUTH CDH 1

REFERENCE # K2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. NSW	CDH, CORE + WIRELINE	SI/55-14	35°00 8	145 43'09"E	4116	-280	396		

REFERENCE: YOO, E.K.
MURRAY INFRABASIN DRILLING PROGRAMME - THE NORTHERN PART OF THE OAKLANDS BASIN
GEOLOGICAL SURVEY OF NEW SOUTH WALES REPORT GS 1981/155 (UNPUBLISHED) Page Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: OAKLANDS

STRATIGRAPHY: MURRAY BASIN SEQ. Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:195 Base Elevation: -79 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERILDERIE FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:348 Base Elevation: -232 Thickness: 153
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COORABIN CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:377 Base Elevation: -261 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -280 * Thickness:)19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

COOPER

BASIN

CONTROL POINT: ALKINA 1

REFERENCE # C10

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-12	26 12'19"S	142 32'51"E	+203	+207	-2474	2681	

REFERENCE: LIST OF FORMATION TOPS IN ALKINA NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: pth to Base:2214 Base Elevation: -2007 Thickness: 2210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2555 Base Elevation: -2348 Thickness: 341
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2651 Base Elevation: -2444 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2651 Base Elevation: -2444 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS TOOLACHEE FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2474± Thickness: ?30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ARRABURY 1

REFERENCE # C19

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FLINDERS PETROL.	RDH, CORE + WIRELINE	SG/54-15	27 11'35"S	141 04'50"E	+126	+131	-2813	2944	

REFERENCE: THIS REPORT

Page: Publn Year:

Cross Reference: FLINDERS PETROLEUM N.L., 1970, FLINDERS PETROLEUM ARRABURY NO.1 WELL COMPLETION REPORT, DMR FILE 69/2035

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2273 Base Elevation: -2142 Thickness: 2268
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2617 Base Elevation: -2486 Thickness: 344
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2670 Base Elevation: -2539 Thickness: 53
Geologic Description: INTERBEDDED FINE WHITE SANDSTONES AND CARBONACEOUS SHALES. SHALES GRADE INTO & OUT OF COAL. 17% COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM	2630	-2499	9

Tectonic Structure:
Remarks: BASE OF UNIT INDICATED BY DIPMETER & OTHER LOGS. RESTS UNCONFORMABLY ON OLDER PALAEOZOIC SEDIMENTS.

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -2813* Thickness:)274
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : BARCOO JUNCTION 1

REFERENCE # C1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CRUSADER OIL	RDH	SG/54-8	25 03'41"S	143 02'12"E		+141	-3762	3983	

REFERENCE: LIST OF FORMATION TOPS IN BARCOO JUNCTION NO.1, PROVIDED BY CRUSADER OIL N.L.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2554 Base Elevation: -2413 Thickness: 2554
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2661 Base Elevation: -2520 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2757 Base Elevation: -2616 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADAVALE BASIN SEQ. Age: DEVONIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -3762* Thickness: >1146
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BARROLKA 1

REFERENCE # C15

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. AQUITAINE	RDH	SG/54-11	26 54'02"S	141 41'04"E	+107	+111	-2571	2682	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY A. MOND, BMR

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2173 Base Elevation: -2062 Thickness: 2169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2554 Base Elevation: -2443 Thickness: 381
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2615 Base Elevation: -2504 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2667 Base Elevation: -2556 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2667 Base Elevation: -2556 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS TOOLACHEE & PATCHAWARRA FMS

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2571# Thickness: 115

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BARROLKA EAST 1

REFERENCE # C14

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-11	26 51'20"S	141 47'59"E	+92	+97	-2616	2713	

REFERENCE: LIST OF FORMATION TOPS IN BARROLKA EAST NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2083 Base Elevation: -1986 Thickness: 2078
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2524 Base Elevation: -2427 Thickness: 441
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2585 Base Elevation: -2488 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2686 Base Elevation: -2589 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2686 Base Elevation: -2589 Thickness: 162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2616# Thickness:)27

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BIG LAKE 1

REFERENCE # C47

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SH/54-2	28 12'36"S	140 20'07"E		+42	-3017	3059	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, BM R RECORD 1973/17 (UNPUB.); WILTSHIRE, MJ, 1975, BMR (UNPUB.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2125 Base Elevation: -2083 Thickness: 2125
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2292 Base Elevation: -2250 Thickness: 167
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2390 Base Elevation: -2348 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2408 Base Elevation: -2366 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSEWEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2456 Base Elevation: -2414 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2526 Base Elevation: -2484 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2586 Base Elevation: -2544 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2915 Base Elevation: -2873 Thickness: 329
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2953 Base Elevation: -2911 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2953 Base Elevation: -2911 Thickness: 660
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -3017* Thickness:)106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BODALLA 1

REFERENCE # CB	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	BP PETROL. DEV.	RDH, CORE + WIRELINE	SG/54-12	26 25'43"S	143 26'09"E	+148	+152	-2533	2685	

REFERENCE:
THIS REPORT

Page Publn Year:

Cross Reference: BUCHAN, S.H., 1968, BP PETROLEUM DEV. AUST. BODALLA NO.1 WELL COMPLETION REPORT, BMR FILE 67/4267 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1804 Base Elevation: -1652 Thickness: 1800
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1875 Base Elevation: -1723 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1920 Base Elevation: -1768 Thickness: 45
Geologic Description: BLK BIT COAL WITH INTBDS V DK GY MUDST & V LT BUFF FIRECLAY, & WH F-C BUT DOMINANTLY M GR ANGULAR PY PMLY SST WITH WH CEMENT (BUCHAN, 1968)
Reported Environment:
Interpreted Environment: FINING-UP CYCLE ON S.P. LOG - INDICATES CHANGE IN FLUVIAL STYLE
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1880	-1728	1
COAL	1885	-1733	3
COAL	1892	-1740	5
COAL	1907	-1755	2

Tectonic Structure:
Remarks: CONTAINS P3B/P4 MICROFLORA (BUCHAN, 1968). 1 M COAL SEAM AT 1875 M. ALL COAL SEAM THICKNESSES APPROXIMATE

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1920 Base Elevation: -1768 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS TOOLACHEE FM

STRATIGRAPHY: ADAVALE BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2533# Thickness: 7765
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

CONTROL POINT : BOXWOOD 1

REFERENCE # C43

Organisation	Type	Mapne	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
DELHI AUST. PET.	RCH, WIRELINE	SH/54-2	28 31'24"S	139 58'43"E		+28	-1965	1933	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979
Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// SMITH, K.G., NICHOLAS, E., & RAINE, M.J., 1969, BMR RECORD 1969/153

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1675 Base Elevation: -1647 Thickness: 1675
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1695 Base Elevation: -1667 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: ROSEWEATH SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1707 Base Elevation: -1679 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FORM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1770 Base Elevation: -1742 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1802 Base Elevation: -1774 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1857 Base Elevation: -1829 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: CIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1857 Base Elevation: -1829 Thickness: 182
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1877 Base Elevation: -1849 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -1905* Thickness: >56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BROLGA 1

REFERENCE # C29

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SG/54-14	27 35'36"S	140 01'28"E	+34	+40	-2927	2967	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 10 Publn Year: 1979

Cross Reference: WOOLDRIDGE, P., 1972, BROLGA NO. 1 WELL COMPLETION REPT, BMR FILE 72/1018 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2409 Base Elevation: -2369 Thickness: 2403
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2643 Base Elevation: -2603 Thickness: 234
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2680 Base Elevation: -2640 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2691 Base Elevation: -2651 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2700 Base Elevation: -2660 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2918 Base Elevation: -2878 Thickness: 218
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2940 Base Elevation: -2900 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2940 Base Elevation: -2900 Thickness: 296
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2927* Thickness:)2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BRUMBY 1

REFERENCE # C62

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, CORE + WIRELINE	SH/54-2	28 24'37"S	140 59'35"E	+79	+84	-2267	2351	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 11 Publn Year: 1979

Cross Reference: LUNT, C.K., 1972, DELHI-SANTOS-VAMGAS BRUMBY NO.1 WELL COMPLETION REPORT, PPR FI LE 72/939 (UNPUBL); WILTSHIRE, M.J., 1975, PPR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1741 Base Elevation: -1657 Thickness: 1736
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1816 Base Elevation: -1732 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1981 Base Elevation: -1897 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2006 Base Elevation: -1922 Thickness: 25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2087 Base Elevation: -2003 Thickness: 81
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2139 Base Elevation: -2055 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2204 Base Elevation: -2120 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2337 Base Elevation: -2253 Thickness: 133
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2337 Base Elevation: -2253 Thickness: 521
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2267* Thickness: >14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BUDGERYGAR 1

REFERENCE # C2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDH, CORE + WIRELINE	SG/54-8	25 14'19"S	143 48'28"E	+184	+189	-1442	1631	

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: CADART, M.L., 1969, ALLIANCE BUDGERYGAR 1, WELL COMPLETION REPORT, BMR FILE 68/2 051 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1573 Base Elevation: -1384 Thickness: 1568
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOWER BOUNDARY BASED ON GAMMA LOG

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1612 Base Elevation: -1423 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1617 Base Elevation: -1428 Thickness: 5
Geologic Description: BLK SOFT LAMINATED SILTY COAL INTBDD WITH LT PINK, BROWN SOFT & DK BROWN SANDY SLTST, AND BLK SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1617 -1428 2 CA
Tectonic Structure:
Remarks PALYNOLOGICAL AGE - ?UPPER PERMIAN (?STAGE 5)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1617 Base Elevation: -1428 Thickness: 5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -1442? Thickness:)14
Geologic Description: TONALITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : BURKE 1

REFERENCE # C51

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SH/54-2	28 07'43"S	140 57'19"E	+83	+87	-2469	2556	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 7 Publn Year: 1979

Cross Reference: WILTSHIRE, M.J., 1972, BURKE NO.1 WELL COMPLETION REPORT, BMR FILE 72/2728 (UNPUBL.); WILTSHIRE, M.J., 1975, BMR (UNPUBL

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1910 Base Elevation: -1823 Thickness: 1906
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2105 Base Elevation: -2018 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2218 Base Elevation: -2131 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2242 Base Elevation: -2155 Thickness: 24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2292 Base Elevation: -2205 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2341 Base Elevation: -2254 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2387 Base Elevation: -2300 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2525 Base Elevation: -2438 Thickness: 138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2525 Base Elevation: -2438 Thickness: 420
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, HURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2469* Thickness:)31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BURLEY 1

REFERENCE # C28

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SG/54-14	27 48'16"S	140 39'48"E		+53	-3597	3650	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, BM R RECORD 1973/17 (UNPUB.); WILTSHIRE, MJ, 1975, BMR (UNPUB.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2277 Base Elevation: -2224 Thickness: 2277
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2658 Base Elevation: -2605 Thickness: 381
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2815 Base Elevation: -2762 Thickness: 157
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2911 Base Elevation: -2858 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM THORNTON, 1979

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2971 Base Elevation: -2918 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM THORNTON, 1979

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:3109 Base Elevation: -3056 Thickness: 138
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM THORNTON, 1979

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3191 Base Elevation: -3138 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: ~3597# Thickness:)459
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: ~3597# Thickness:)992
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

CONTROL POINT: CHANDOS 1

REFERENCE # C5

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDH, CORE + WIRELINE	SG/54-8	25 30'14"S	143 19'36"E	+221	+225	-2746	2971	

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: LAING, A.C.M., & BENEDEK, S., 1966, ALLIANCE CHANDOS 1 WELL COMPLETION REPORT, B MR FILE 66/4189 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2124 Base Elevation: -1899 Thickness: 2120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2373 Base Elevation: -2148 Thickness: 249
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2420 Base Elevation: -2195 Thickness: 47
Geologic Description: BLK FISS SEMI-VIT COAL, LT GY-LT BR VF-M FAIRLY SRTD QZ SST WITH KAOL MATRIX, BLK CARB MICAC PY SH & SLTST, & BR ARG SH (LAING & BENEDEK, 1966)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	2382	-2157	9
COAL	2388	-2163	3
COAL	2408	-2183	1.5

Tectonic Structure:
Remarks: STAGE 5 MICROFLORA. B'DARY IDENTIFIED BY DIPMETER CHANGE. CHANGE IN PALYNOLOGY + DIPMETER SUGGEST ANGULAR UNCONFORMITY

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2436 Base Elevation: -2211 Thickness: 16
Geologic Description: GY VF CARBONACEOUS QUARTZ SANDSTONE WITH KAOLINITIC MATRIX & SILICEOUS-DOLOMITIC CEMENT (LAING & BENEDEK, 1966)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: STAGE 3 MICROFLORA.

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2436 Base Elevation: -2211 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS TOOLACHEE & PATCHAWARRA FMS

STRATIGRAPHY: ADAVALE BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code: X106
Basal Information: Depth to Base: TD Base Elevation: -2746 Thickness: >535
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CHANDOS SOUTH 1

REFERENCE # C6

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDM, CORE + WIRELINE	SG/54-8	25 57'02"S	143 22'00"E	+204	+209	-2241	2450	

REFERENCE: THIS REPORT

Page: Publn Year:

Cross Reference: LAING, A.C.M., & CADART, N.C., 1970, ALLIANCE CHANDOS SOUTH NO.1 WELL COMPLETION REPORT, BMR FILE 69/2025 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2131 Base Elevation: -1922 Thickness: 2126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2348 Base Elevation: -2139 Thickness: 217
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2374 Base Elevation: -2165 Thickness: 26
Geologic Description: INTBDD V DK GY V CARB SH (WITH PLT IMPR); BLK SUB-BIT COAL (DURAIN MINOR VITRAIN), WH F (SOME C-VC) SUBANG-SUBRND QZ SST WITH SIL MATRIX (W.C.R)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2362	-2153	10
COAL	2370	-2161	3

Tectonic Structure:
Remarks: UPPER STAGE 5 MICROFLORA (LAING & CADART, 1970)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2412 Base Elevation: -2203 Thickness: 38
Geologic Description: LT GY F-C SUBRND-ANG QZ SST IN KAOL MTX, DULL BLK MASS-WEAKLY FOLIATED COAL, DK GY CARB PY PART MICAC SH, LT GY VF-F SST (LAING & CADART, 1970)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2389	-2180	4
COAL	2392	-2183	2
COAL	2397	-2188	1

Tectonic Structure:
Remarks: STAGE 3 MICROFLORA

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2412 Base Elevation: -2203 Thickness: 64
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM & PATCHAWARRA FM

STRATIGRAPHY: ADAVALE BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2241' Thickness: >30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : CHERRI 1

REFERENCE # C69

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PEXA OIL N.L.	RDH, WIRELINE	SH/54-6	29 07'21"S	140 12'45"E		+36	-1365	1481	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page: Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// NICHOLAS, E., 1981, BMR RECORD 1981/46

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1210 Base Elevation: -1174 Thickness: 1210
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1255 Base Elevation: -1219 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION D-D (THORNTON, 1979)

STRATIGRAPHY: HURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1275 Base Elevation: -1239 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION D-D (THORNTON, 1979)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1310 Base Elevation: -1274 Thickness: 35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION D-D (THORNTON, 1979)

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1372 Base Elevation: -1336 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION D-D (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1372 Base Elevation: -1336 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1365# Thickness:)29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: COONATIE 1

REFERENCE # C26

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FLINDERS PETROL.	RDH, WIRELINE	SG/54-14	27 29'06"S	140 20'15"E		+40	-3131	3171	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, BM R RECORD 1973/17 (UNPUB.); WILTSHIRE, MJ, 1975, BMR (UNPUB.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2508 Base Elevation: -2468 Thickness: 2508
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2842 Base Elevation: -2802 Thickness: 334
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2922 Base Elevation: -2882 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2949 Base Elevation: -2909 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2976 Base Elevation: -29[illegible] Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:3094 Base Elevation: -3054 Thickness: 118
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3144 Base Elevation: -3104 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3144 Base Elevation: -3104 Thickness: 302
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:3167 Base Elevation: -3127 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -3131* Thickness:)4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CORKWOOD 1

REFERENCE # C48

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SH/54-2	28 01'10"S	140 48'11"E	+92	+96	-2064	2160	

REFERENCE: LIST OF FORMATION TOPS IN CORKWOOD NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1788 Base Elevation: -1692 Thickness: 1784
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1905 Base Elevation: -1809 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1954 Base Elevation: -1858 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1966 Base Elevation: -1870 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2129 Base Elevation: -2033 Thickness: 163
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2129 Base Elevation: -2033 Thickness: 224

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2064m Thickness: >31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CUMBROO 1

REFERENCE # C7

Organisation	Type	Hapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDH, CORE + WIRELINE	SG/54-12	26 13'40"S	143 22'47"E	+162	+166	-2041	2207	

REFERENCE: THIS REPORT

Page: Publn Year:

Cross Reference: CAMPE, G.C., 1968, ALLIANCE CUMBROO NO.1 WELL COMPLETION REPORT, BMR FILE 68/204 3 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1971 Base Elevation: -1805 Thickness: 1967
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2131 Base Elevation: -1965 Thickness: 160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -2041# Thickness:)76
Geologic Description: INTBDD LT-DK GY CARB SH WITH PLT IMPR, WH-LT GY-LT BN VF-M QZ SSTS IN KAOL, SIL, ARG MTX, DK GY-BLK V CARB SLTST, LT-DK BN ARG SLTST, MINOR COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	2173	-2207	12 CA

Tectonic Structure:
Remarks: PALYNOLOGY. UPPER PERMIAN AT 2150 M, ?UPPER CARB-LOWER PERMIAN AT 2204 M (PATEN IN CAMPE, 1968). GEOL DESC.- CAMPE, 1968

CONTROL POINT: DELLA 1

REFERENCE # C50

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PURSUIT OIL N.L.	RDH, WIRELINE	SH/54-2	28 06'34"S	140 40'25"E		+62	-2113	2175	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; NICHOLAS, E., 1971, BMR RECORD 1971/46 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1821 Base Elevation: -1759 Thickness: 1821
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1949 Base Elevation: -1887 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2025 Base Elevation: -1963 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2054 Base Elevation: -1992 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2156 Base Elevation: -2094 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2156 Base Elevation: -2094 Thickness: 268
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2113# Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DELLA 3

REFERENCE # C49

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SH/54-2	28 03'54"S	140 40'46"E		+68	-2224	2292	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page: Publn Year:

Cross Reference: THORNTON, R.C.H., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, BM R RECORD 1973/17 (UNPUB.); WILTSHIRE, HJ

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1853 Base Elevation: -1785 Thickness: 1853
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2004 Base Elevation: -1936 Thickness: 151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2082 Base Elevation: -2014 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2104 Base Elevation: -2036 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2253 Base Elevation: -2185 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2253 Base Elevation: -2185 Thickness: 249
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: HERRINELIA FM Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2269 Base Elevation: -2201 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2224* Thickness: >23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DILCHEE 1

REFERENCE # C52

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SH/54-2	28°12'38"S	140°55'26"E	+75	+82	-2708	2790	

REFERENCE: LIST OF FORMATION TOPS IN DILCHEE NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1921 Base Elevation: -1839 Thickness: 1914
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2135 Base Elevation: -2053 Thickness: 214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2264 Base Elevation: -2182 Thickness: 129
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2294 Base Elevation: -2212 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2370 Base Elevation: -2288 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2430 Base Elevation: -2348 Thickness: 60

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2490 Base Elevation: -2408 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2758 Base Elevation: -2676 Thickness: 268
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2758 Base Elevation: -2676 Thickness: 623
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2708$ Thickness:)32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DURHAM DOWNS 1

REFERENCE # C16

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI-SANTOS	RDH, CORE + WIRELINE	SG/54-15	27 04'56"S	141 47'28"E	+107	+111	-2631	2742	

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: WILTSHIRE, M.J., 1973, DELHI-SANTOS-VAMGAS-FLINDERS PET.-WMC DURHAM DOWNS NO.1 W ELL COMPLETION REPORT, BMR FILE 73/229 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2145 Base Elevation: -2034 Thickness: 2141
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: DURHAM DOWNS 1 DRILLED ON BASEMENT HIGH
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2472 Base Elevation: -2361 Thickness: 327
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2572 Base Elevation: -2461 Thickness: 100
Geologic Description: INTBDD DK GY-BLK CARB SH & SLTST, F-C SUBANG QZ SST WITH SIL & MINOR CLAY CEMENT (TIGHT-POORLY POROUS), BLK BITUMINOUS COAL (WILTSHIRE, 1973)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL, 2 SMS	2489	-2378	8
COAL	2504	-2393	1
COAL	2528	-2417	2
COAL INTERVAL	2554	-2443	8

Tectonic Structure:
Remarks: UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY: UPPER STAGE 5 (WILTSHIRE, 1973)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2683 Base Elevation: -2572 Thickness: 111
Geologic Description: LITHOLOGIES AS FOR TOOLACHEE FM. ALSO PEBBLY QUARTZOSE CONGLOMERATIC SANDSTONE (WILTSHIRE, 1973)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2583	-2472	2
COAL	2600	-2489	1
COAL	2606	-2495	2
COAL	2628	-2517	2

Tectonic Structure:
Remarks: PALYNOSTRATIGRAPHY: 2572-2596 M STAGE 3-4; 2600 M NO OLDER THAN STAGE 2. 1 M COAL SEAM AT 2611 M (WILTSHIRE, 1973)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2683 Base Elevation: -2572 Thickness: 211

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2704 Base Elevation: -2593 Thickness: 21
Geologic Description: M-DK GY MASSIVE SHALE & MINOR FINE WHITE HARD TIGHT SANDSTONE (WILTSHIRE, 1973)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2631* Thickness: >38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: FLY LAKE 3

REFERENCE # C31

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SG/54-14	27 39'45"S	139 56'21"E		+37	-2935	2972	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page: Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GSSA BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, DM R RECORD 1973/17; WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2400 Base Elevation: -2363 Thickness: 2400
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2595 Base Elevation: -2558 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2630 Base Elevation: -2593 Thickness: 35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2652 Base Elevation: -2615 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2659 Base Elevation: -2622 Thickness: 7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2929 Base Elevation: -2892 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2959 Base Elevation: -2922 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2959 Base Elevation: -2922 Thickness: 364
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST.

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2935# Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: FLY LAKE 4

REFERENCE # C30

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
SANTOS LTD.	RDH	SG/54-14	27 36'30"S	139 59'48"E		+34	-2873	2907	

REFERENCE: LIST OF FORMATION TOPS IN FLY LAKE NO.4, PROVIDED BY SANTOS LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERDHANDA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2411 Base Elevation: -2377 Thickness: 2411
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2614 Base Elevation: -2580 Thickness: 203
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2650 Base Elevation: -2616 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2657 Base Elevation: -2623 Thickness: 7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2868 Base Elevation: -2834 Thickness: 211
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2888 Base Elevation: -2854 Thickness: 20

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2888 Base Elevation: -2854 Thickness: 274
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, HURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X10B
Basal Information: Depth to Base:TD Base Elevation: -2873# Thickness: >19
Geologic Description
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GIDGEALPA 1

REFERENCE # C39

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI-SANTOS	RDH, CORE + WIRELINE	SG/54-14	27 56'46"S	140 04'56"E		+39	-3958	3997	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 10 Publn Year 1979

Cross Reference: HARRISON, J., & HIGGINBOTHAM, G.T., 1963, BMR FILE 63/1029 (UNPUBLISHED); BMR, 1966, PSSA PUBLN 73; WILTSHIRE, M.J., 1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2190 Base Elevation: -2151 Thickness: 2190
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2344 Base Elevation: -2305 Thickness: 154
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2432 Base Elevation: -2393 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2463 Base Elevation: -2424 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2665 Base Elevation: -2626 Thickness: 202
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2665 Base Elevation: -2626 Thickness: 321
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X186
Basal Information: Depth to Base:2777 Base Elevation: -2738 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -3958 Thickness: >1220
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GIDGEALPA 6

REFERENCE # C?

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI-SANTOS	RDH, WIRELINE	SG/54-14	27 55'24"S	140 02'39"E		+38	-2341	2379	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// MARCHANT, S., 197 4, BMR RECORD 1974/151

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2099 Base Elevation: -2061 Thickness: 2099
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2149 Base Elevation: -2111 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2201 Base Elevation: -2163 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2217 Base Elevation: -2179 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2306 Base Elevation: -2268 Thickness: 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2386 Base Elevation: -2268 Thickness: 157
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X186
Basal Information: Depth to Base:TD Base Elevation: -2341± Thickness:)73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GILPEPPEE 1

REFERENCE # C12

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDH, CORE + WIRELINE	SG/54-12	26 25'25"S	141 33'17"E	+98	+103	-3162	3265	

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: MULREADY, J.N., 1978, ALLIANCE GILPEPPEE NO.1 WELL COMPLETION REPORT, BMR FILE 6 9/2640 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2370 Base Elevation: -2267 Thickness: 2365
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2863 Base Elevation: -2760 Thickness: 493
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:3192 Base Elevation: -3089 Thickness: 329
Geologic Description: WH-LT GY F-M WELL SRTD QZ SST IN SIL-KAOL MTX, GY SANDY SL CARB PY CLAUC SLTST, M-DK GY CARB SL MICAC SH, BLK BRITTLE LUSTROUS COAL (VEINS PY)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2864	-2761	1
COAL	2872	-2769	2
COAL	2985	-2882	1

Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - MULREADY, 1970

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:3192 Base Elevation: -3089 Thickness: 329
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM

STRATIGRAPHY: ADAVALE BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -3162* Thickness:)73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GILPEPPEE 2

REFERENCE # C13

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-11	26 26'54"S	141 36'05"E	+133	+137	-2823	2960	

REFERENCE: LIST OF FORMATION TOPS IN GILPEPPEE NO.2, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2348 Base Elevation: -2211 Thickness: 2344
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2733 Base Elevation: -2596 Thickness: 395
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2788 Base Elevation: -2651 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2788 Base Elevation: -2651 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2823* Thickness: >172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: HUME 1

REFERENCE # C72

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SH/54-3	28 06'39"S	141 36'02"E	+90	+94	-2869	2163	

REFERENCE: LIST OF FORMATION TOPS IN HUME NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X161
Basal Information: Depth to Base:1786 Base Elevation: -1692 Thickness: 1782
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1843 Base Elevation: -1749 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1980 Base Elevation: -1886 Thickness: 137
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1999 Base Elevation: -1905 Thickness: 19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2056 Base Elevation: -1962 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2082 Base Elevation: -1988 Thickness: 26

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2110 Base Elevation: -2016 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2127 Base Elevation: -2033 Thickness: 17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2127 Base Elevation: -2033 Thickness: 284
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2069# Thickness:)36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: INGELLA 1

REFERENCE # C4

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-8	25 31'56"S	142 47'24"E	+124	+129	-2567	2696	

REFERENCE: LIST OF FORMATION TOPS IN INGELLA NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2365 Base Elevation: -2236 Thickness: 2360
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER TRIAS Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2437 Base Elevation: -2308 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: KAPPAMERRI FM Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:2668 Base Elevation: -2539 Thickness: 231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ORDOVICIAN? Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -2567* Thickness: >28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: INNAMINCKA 1

REFERENCE # C22

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI AUST. PET.	RDH, CORE + WIRELINE	SG/54-14	27 29'21"S	140 55'08"E	+122	+126	-3726	3852	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA

Page: Publn Year:

Cross Reference: BMR, 1961, INNAMINCKA NO. 1 WELL, SOUTH AUSTRALIA, PET. SEARCH SUBS. ACTS PUBL. 9; WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1804 Base Elevation: -1678 Thickness: 1800
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2049 Base Elevation: -1923 Thickness: 245
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2149 Base Elevation: -2023 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -3726* Thickness: >1703
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: JACK LAKE 1

REFERENCE # C37

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-14	27 56'37"S	139 49'18"E	+27	+33	-3113	3146	

REFERENCE: LIST OF FORMATION TOPS IN JACK LAKE NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X161
Basal Information: Depth to Base:2296 Base Elevation: -2263 Thickness: 2290
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2439 Base Elevation: -2406 Thickness: 143
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2501 Base Elevation: -2468 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2519 Base Elevation: -2486 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2568 Base Elevation: -2535 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2599 Base Elevation: -2566 Thickness: 31

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2998 Base Elevation: -2965 Thickness: 399
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:3102 Base Elevation: -3069 Thickness: 104
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:3102 Base Elevation: -3069 Thickness: 663
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, ROSENEATH SH, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:3107 Base Elevation: -3074 Thickness: 5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:TD Base Elevation: -3113* Thickness:)39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: JACKSON 1

REFERENCE # C18

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-15	27 36'36"S	142 25'12"E	+116	+121	-1624	1745	

REFERENCE: LIST OF FORMATION TOPS IN JACKSON NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1497 Base Elevation: -1376 Thickness: 1492
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1508 Base Elevation: -1387 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1570 Base Elevation: -1449 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1600 Base Elevation: -1479 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1706 Base Elevation: -1585 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1706 Base Elevation: -1585 Thickness: 198

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -16248 Thickness: >39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KANOWANA 1

REFERENCE # C35

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
VAMGAS N.L.	RDH, CORE + WIRELINE	SG/54 14	27 47'57"S	139 58'42"E	+30	+36	-3087	3123	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 10 Publn Year: 1979

Cross Reference: WOOLDRIDGE, P., 1973, VAMGAS ET AL. KANOWANA NO.1 WELL COMPLETION REPORT, BMR FI LE 72/3282 (UNPUBL.); WILTSHIRE, M.J., 1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2339 Base Elevation: -2303 Thickness: 2339
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2542 Base Elevation: -2506 Thickness: 203
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2601 Base Elevation: -2565 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2658 Base Elevation: -2622 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2680 Base Elevation: -2644 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:3059 Base Elevation: -3023 Thickness: 379
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X186
Basal Information: Depth to Base:3090 Base Elevation: -3054 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3090 Base Elevation: -3054 Thickness: 553
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -3087* Thickness:)33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KUDRIEKE 1

REFERENCE # C25

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SG/54-14	27 28'56"S	140 10'50"E		+41	-3180	3221	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

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Cross Reference: THORNTON, R.C.N., 1979, GSSA BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, BM R RECORD 1973/17 (UNPUBL.); WILTSHIRE, MJ, 1975, BMR (UNP.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2502 Base Elevation: -2461 Thickness: 2502
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2820 Base Elevation: -2779 Thickness: 318
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2900 Base Elevation: -2859 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2915 Base Elevation: -2874 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2929 Base Elevation: -2888 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:3081 Base Elevation: -3040 Thickness: 152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X166
Basal Information: Depth to Base:3108 Base Elevation: -3067 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF TIRRAWARRA SST (IN LIST) USED AS DATUM

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3108 Base Elevation: -3067 Thickness: 273
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X168
Basal Information: Depth to Base:)3118 Base Elevation: -3077# Thickness:)10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE OF MERRIMELIA FM NOT GIVEN. NOT KNOWN WHETHER BASEMENT ENCOUNTERED BEFORE TOTAL DEPTH REACHED

CONTROL POINT: KUMBARIE 1

REFERENCE # C66.

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PEXA OIL N.L.	RDH, CORE + WIRELINE	SH/54-2	28 54'58"S	140 11'00"E		+27	-1660	1687	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 8 Publn Year: 1979

Cross Reference: CASEY, D.J., 1970, PEXA OIL N.L. KUMBARIE NO.1 WELL COMPLETION REPORT, BMR FILE 70/365 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1382 Base Elevation: -1355 Thickness: 1382
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1412 Base Elevation: -1385 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1440 Base Elevation: -1413 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1525 Base Elevation: -1498 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1618 Base Elevation: -1591 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1618 Base Elevation: -1591 Thickness: 232
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1644 Base Elevation: -1617 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -1660* Thickness:)43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LAKE HOPE 1

REFERENCE # C40 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
MURUMBA OIL N.L.	RDH, WIRELINE	SH/54-2	28 07'22"S	139 38'10"E		+16	-2484	2500	?

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STN. AUST. BULLETIN 49 // PETROLEUM TECHNOL OGY SECTION, 1973, BMR RECORD 1973/17

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:2028 Base Elevation: -2012 Thickness: 2028
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2032 Base Elevation: -2016 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2060 Base Elevation: -2044 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2085 Base Elevation: -2069 Thickness: 25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2309 Base Elevation: -2293 Thickness: 224
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:2309 Base Elevation: -2293 Thickness: 281
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2473 Base Elevation: -2457 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2484* Thickness:)27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MCKINLAY 1

REFERENCE # C58

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Rot El	T.Dpth	status code
DELHI PETROLEUM	RPM	SH/54-2	22 28'21"S	140 28'47"E	+40	+43	-1523	1566	

REFERENCE: LIST OF FORMATION TOPS IN MCKINLAY NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1524 Base Elevation: -1481 Thickness: 1521
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PRE-MESOZOIC Age: PRE-MESOZOIC Interpretation Code:X102
Basal Information: Depth to Base:TD Base Elevation: -1523# Thickness:)42
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MERRIMELIA 7

REFERENCE # C34

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-14	27 44'48"S	140 10'12"E	+39	+45	-2228	2273	

REFERENCE: LIST OF FORMATION TOPS IN MERRIMELIA NO.7, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2134 Base Elevation: -2089 Thickness: 2128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2244 Base Elevation: -2199 Thickness: 110
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -2228* Thickness: >29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MOOMBA 2

REFERENCE # C46

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI AUST. PET.	RDH, WIRELINE	SH/54-2	28 10'56"S	140 13'36"E		+35	-2970	3005	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page: Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; MARCHANT, S., 1974, BMR RECORD 1974/15 1 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2112 Base Elevation: -2077 Thickness: 2112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2259 Base Elevation: -2224 Thickness: 147
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: FORMATION PICK FROM WILTSHIRE,1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2372 Base Elevation: -2337 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2408 Base Elevation: -2373 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2471 Base Elevation: -2436 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2537 Base Elevation: -2502 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2590 Base Elevation: -2555 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2674 Base Elevation: -2639 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2674 Base Elevation: -2639 Thickness: 420
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2970* Thickness: >331
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : MOOMBA 8

REFERENCE # C45	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bor El	T.Dpth	status code
	DELMI AUST. PET.	RDH, WIRELINE	SH/54-2	28 06'44"S	140 07'47"E		+36	-2736	2772	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SASS BULLETIN 49; SMITH, K.G., ET AL., 1969, BMR RECORD 1969/153 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2173 Base Elevation: -2137 Thickness: 2173
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2329 Base Elevation: -2293 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2421 Base Elevation: -2385 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2440 Base Elevation: -2404 Thickness: 19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSEMEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2496 Base Elevation: -2460 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS DETERMINED BY O'BRIEN (THIS PROJECT) FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2560 Base Elevation: -2524 Thickness: 64
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2606 Base Elevation: -2570 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2764 Base Elevation: -2728 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2764 Base Elevation: -2728 Thickness: 436
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2736# Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MT. HOWITT 1

REFERENCE # C9

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI-SANTOS	RDH, CORE + WIRELINE	SG/54-11	26 37'27"S	142 28'17"E	+139	+144	-2209	2353	

REFERENCE: THIS REPORT

Page Publn Year:

Cross Reference: DELHI AUSTRALIAN PETROLEUM LTD, 1966, DELHI-SANTOS MT. HOWITT 1 WELL COMPLETION REPORT, BMR FILE 66/4195 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1714 Base Elevation: -1570 Thickness: 1709
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPANERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2107 Base Elevation: -1963 Thickness: 393
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2243 Base Elevation: -2099 Thickness: 136
Geologic Description: INTBDD WH-GY-BR VF-VC CARB MICAC ANG-SUBRND QZ SST WITH SIL KAOL MTX, GY-BLK SILTY MICAC CARB SH, WH-DK GY & BR MICAC KAOL CARB SLTST, & COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2124	-1980	5.2
COAL WITH SH INTBDS	2141	-1997	4.6
COAL WITH SH INTBDS	2152	-2008	7.6
COAL	2166	-2022	3.0

Tectonic Structure:
Remarks 2 M COAL SEAMS ALSO AT 2109, 2117 & 2131 M. GEOLOGIC DESCRIPTION FROM DELHI AUST., 1966

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2263 Base Elevation: -2119 Thickness: 20
Geologic Description: DK GY CGL WITH PBLS OF SH, SST, QZ IN SHALY MTX, DK GY MASSIVE SIL CARB SLTST, & DK GY VF-VC ANG-RND QZ SST WITH SIL & CARB MTX (DELHI, 1966)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CGL POSSIBLY A TILLITE (DELHI, 1966)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2209+ Thickness: ?90
Geologic Description: INDURATED SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks:

CONTROL POINT: MUDLALEE 1

REFERENCE # C55

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI AUST. PET.	RDH, WIRELINE	SH/54-2	28 19'22"S	140 31'31"E		+55	-2636	2691	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; SMITH, K.G., ET AL., 1969, BMR RECORD 1969/153 (UNPUBLISHED); WILTSHIRE, M.J.,1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1753 Base Elevation: -1698 Thickness: 1753
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1784 Base Elevation: -1729 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1845 Base Elevation: -1790 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1848 Base Elevation: -1793 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1895 Base Elevation: -1840 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2013 Base Elevation: -1958 Thickness: 118
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CIDGEALPA GP Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2013 Base Elevation: -1958 Thickness: 229
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2068 Base Elevation: -2013 Thickness: 55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2636* Thickness:)623
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MULGA 1

REFERENCE # C65

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI AUST. PET.	RDH, WIRELINE	SH/54-2	28 39'35"S	140 31'50"E		+44	-1930	1974	

REFFRENCE:

LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// SMITH, K.G., NICHOLAS, E., & RAINE, M.J., 1970, BMR RECORD 1970/37

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1622 Base Elevation: -1578 Thickness: 1622
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1682 Base Elevation: -1638 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1702 Base Elevation: -1658 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1729 Base Elevation: -1685 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1792 Base Elevation: -1748 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1850 Base Elevation: -1806 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1939 Base Elevation: -1895 Thickness: 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION C-C (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1939 Base Elevation: -1895 Thickness: 317
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -1930± Thickness: >35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MURTEREE 1

REFERENCE # C57

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PURSUIT OIL N.L.	RDH, WIRELINE	SH/54-2	28 23'47"S	140 34'24"E		+45	-2159	2204	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; NICHOLAS, E., 1971, BMR RECORD 1971/46 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1743 Base Elevation: -1698 Thickness: 1743
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1801 Base Elevation: -1756 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1867 Base Elevation: -1822 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1871 Base Elevation: -1826 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1923 Base Elevation: -1878 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:1971 Base Elevation: -1926 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X186
Basal Information: Depth to Base:2144 Base Elevation: -2099 Thickness: 173
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2144 Base Elevation: -2099 Thickness: 343
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X188
Basal Information: Depth to Base:2183 Base Elevation: -2138 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION E-E (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2159* Thickness:)21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MURTEREE C-1

REFERENCE # C56

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SH/54-2	28 25'01"S	140 23'14"E	+32	+36	-2231	2267	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 7 Publn Year: 1979

Cross Reference: LUNT, C.K., 1972, MURTEREE C NO.1 WELL COMPLETION REPORT, BMR FILE 72/2921 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1796 Base Elevation: -1760 Thickness: 1796
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1832 Base Elevation: -1796 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TODLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1883 Base Elevation: -1847 Thickness: 51
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1910 Base Elevation: -1874 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base 1949 Base Elevation: -1913 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2002 Base Elevation: -1966 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2086 Base Elevation: -2050 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2243 Base Elevation: -2207 Thickness: 157
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2243 Base Elevation: -2207 Thickness: 418
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, ROSENEATH SH, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2253 Base Elevation: -2217 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2231* Thickness: >14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ORIENTOS 1

REFERENCE # C78

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI-SANTOS	RDH, CORE + WIRELINE	SG/54-3	28 03'20"S	141 25'38"E	+140	+144	-3369	3513	

REFERENCE: THIS REPORT

Page: Publn Year:

Cross Reference: HARRISON, J., GREER, W.J., & HIGGINBOTHAM, G.T., 1963, DELHI-SANTOS ORIENTOS 1 W ELL COMPLETION REPORT, BMR FILE 62/1118 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1652 Base Elevation: -1508 Thickness: 1648
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1818 Base Elevation: -1674 Thickness: 166
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2004 Base Elevation: -1860 Thickness: 186
Geologic Description: INTBDD BR-LT GY F-VC-CGL ANG-SUBRND XBDD THICK BDD QZ SST, BN-DK GY FISS MICAC SILTY CARB SH, COAL SMS. CARB MAT T'OUT (HARRISON ET AL., 1963)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1869	-1725	7
COAL	1924	-1780	4
COAL	1963	-1819	8
COAL	2004	-1860	5

Tectonic Structure:
Remarks: 2 M COAL SEAM AT 1937 M, 3 M COAL SEAM AT 1989 M. PALYNOLOGICAL AGE DETERMINATION: UPPER PERMIAN (HARRISON ET AL., 1963)

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2031 Base Elevation: -1887 Thickness: 27
Geologic Description: VF SST-SLTST: DARK GREY, SUBROUNDED QZ, KAOLIN CEMENT, TIGHT (HARRISON ET AL., 1963)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2099 Base Elevation: -1955 Thickness: 68
Geologic Description: PREDOMINANTLY DK GY-BLK HARD FISSILE VERY SILTY MICAC CARB SHALE WITH MINOR VF SST-SLTST (HARRISON ET AL., 1963)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2147 Base Elevation: -2083 Thickness: 48
Geologic Description: DK-LT GY CARB F-C ANG FAIRLY SRTD QZ SST WITH KAOL CEMENT (IN PART SIL), INTBDD WITH DK GY FISS MICAC CARB SH & SLTST (HARRISON ET AL., 1963)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2206 Base Elevation: -2062 Thickness: 59
Geologic Description: DARK GREY FISSILE SILTY MICACEOUS VERY CARBONACEOUS SHALE (HARRISON ET AL., 1963)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2221 Base Elevation: -2077 Thickness: 15
Geologic Description: GREY SILTY FISILE MICACEOUS SHALE (HARRISON ET AL., 1963)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2221 Base Elevation: -2077 Thickness: 403
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: ORDOVICIAN? Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -3369* Thickness: >1292
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: PACKSADDLE 1

REFERENCE # C23

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE PETROL.	RDH, CORE + WIRELINE	SG/54-14	27 32'40"S	140 45'37"E	+130	+135	-3034	3169	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 11 Publn Year: 1979

Cross Reference: MULREADY, J.N., 1970, PACKSADDLE NO.1 WELL COMPLETION REPORT, BMR FILE 70/270 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2176 Base Elevation: -2041 Thickness: 2171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAHERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2512 Base Elevation: -2377 Thickness: 336
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2542 Base Elevation: -2407 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2949 Base Elevation: -2814 Thickness: 407
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2985 Base Elevation: -2850 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2985 Base Elevation: -2850 Thickness: 474
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3146 Base Elevation: -3011 Thickness: 161
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -3034± Thickness: >23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: PANDO 2

REFERENCE # C42

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot.El	T.Dpth	status code
DELHI AUST. PET.	RDH, WIRELINE	SH/54-2	28 25'48"S	139 49'44"E	+38	+43	-1853	1896	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979
Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// SMITH, K.G., NICHOLAS, E., & RAINE, M.J., 1970, BMR RECORD 1970/37

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1729 Base Elevation: -1686 Thickness: 1724
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1755 Base Elevation: -1712 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1794 Base Elevation: -1751 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1806 Base Elevation: -1763 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-D (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1806 Base Elevation: -1763 Thickness: 77
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROSENEATH SH, EPSILON FM & MURTEREE SH

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:TD Base Elevation: -1853 Thickness:)90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: STRZELECKI 1

REFERENCE # C53

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PURSUIT OIL N.L.	RDH, WIRELINE	SH/54-2	28 13'07"S	140 38'16"E		+67	-2010	2077	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; NICHOLAS, E., 1971, BMR RECORD 1971/46 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1807 Base Elevation: -1740 Thickness: 1807
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1893 Base Elevation: -1826 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1761 Base Elevation: -1894 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1980 Base Elevation: -1913 Thickness: 19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2051 Base Elevation: -1984 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2051 Base Elevation: -1984 Thickness: 150
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2010* Thickness: >26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT = STRZELECKI 5

REFERENCE # C54

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDN	SH/54-2	28 14'28"S	140 38'45"E	+56	+61	-1858	1918	

REFERENCE: LIST OF FORMATION TOPS IN STRZELECKI NO.5, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1777 Base Elevation: -1717 Thickness: 1773
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1826 Base Elevation: -1766 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1891 Base Elevation: -1831 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1891 Base Elevation: -1831 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -1858# Thickness:)27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TALLALIA 1

REFERENCE # C28

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FLINDERS PETROL.	RDH, CORE + WIRELINE	SG/54-15	27 23'00"S	141 16'00"E	+129	+135	-3057	3192	

REFERENCE:

THIS REPORT

Page Publn Year:

Cross Reference: PEMBERTON, R.L., & LE GAY BRERETON, J., 1971, FLINDERS PETROLEUM TALLALIA NO.1 W ELL COMPLETION REPORT, BMR FILE 70/305 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERCHANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2062 Base Elevation: -1857 Thickness: 1996
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2280 Base Elevation: -2145 Thickness: 278
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2850 Base Elevation: -2715 Thickness: 570
Geologic Description: LT GY VF-F SUBANG POORLY SRTD QZ (SOME LI) VAR CARB SST WITH KAOL-SIL CEMENT, BLK-GY-BN MICROMICAC CARB SH, BLK BRIT VIT COAL, GY-BN CARB SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL T'OUT
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2945 Base Elevation: -2810 Thickness: 95
Geologic Description: LT GY VF-M SST WITH SIL & KAOL CEMENT, V DK GY-BLK SIL HARD SH, LT-M GY VF SST WITH VAR SIL, KAOL & MINOR CALC CEMENTS, GRADING TO SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 2862 -2727 <1
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - PEMBERTON & LE GAY BREPETON, 1971

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2945 Base Elevation: -2810 Thickness: 665
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY:
Basal Information: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X106
Depth to Base:TD Base Elevation: -3057$ Thickness:)247
Geologic Description: M-DK GY SIL HARD SH, OCC V DK GY MICROMICAC, WITH PLT REMS, LT GY HARD SIL SH, VARVED NEAR BASE. CGL QZ SST, GY-GN V HARD BRITTLE SH & SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - PEMBERTON & LE GAY BRERETON, 1971

CONTROL POINT: TANEAR 1

REFERENCE # C11

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. AQUITAINE	RDH	SG/54-11	26 05'22"S	141 55'30"E	+103	+108	-2959	3067	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY A. HOND, BMR

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2498 Base Elevation: -2390 Thickness: 2493
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2781 Base Elevation: -2673 Thickness: 283
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2831 Base Elevation: -2723 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:3031 Base Elevation: -2923 Thickness: 200
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INNAMINCKA RED BEDS Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2959 Thickness:)36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TARTULLA 1

REFERENCE # C17

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-15	27 13'55"S	142 10'20"E	+171	+176	-2418	2594	

REFERENCE: LIST OF FORMATION TOPS IN TARTULLA NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2076 Base Elevation: -1900 Thickness: 2071
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2345 Base Elevation: -2169 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2462 Base Elevation: -2286 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2576 Base Elevation: -2400 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2576 Base Elevation: -2400 Thickness: 231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base: TD Base Elevation: -2418# Thickness: >18

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: THUNDA 1

REFERENCE # C3	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	ALLIANCE OIL DEV	RDH, CORE + WIRELINE	SG/54-8	25 29'30"S	143 28'28"E	+200	+204	-2208	2412	

REFERENCE: THIS REPORT Page Publn Year:

Cross Reference: CADART, M., 1968, ALLIANCE THUNDA 1 WELL COMPLETION REPORT, BMR FILE 68/2023 (UN PUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2149 Base Elevation: -1945 Thickness:)2145
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2323 Base Elevation: -2119 Thickness: 174
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2359 Base Elevation: -2155 Thickness: 36
Geologic Description: DK GY SILTY MICAC CARB SH, BLK BRITTLE & MINOR VITREOUS COAL, GY-BEIGE F-C ANGULAR-SUBANGULAR MAINLY QZ SST WITH SIL-KAOL MATRIX (CADART, 1968)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	2327	-2123	4
COAL	2331	-2127	3
COAL	2342	-2138	3

Tectonic Structure:
Remarks: POSSIBLY TOOLACHEE FM OR CONDENSED SEQUENCE (AS IN AOD CHANDOS 1)

STRATIGRAPHY: ADAVALE BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -2208# Thickness:)53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TICKALARA 1

REFERENCE # C71

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
TOTAL EXPL. AUS.	RDH, CORE + WIRELINE	SH/54-3	28 19'20"S	141 24'50"E	+128	+132	-1625	1757	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 7 Publn Year: 1979

Cross Reference: SWEENEY, P.J., JACQUE, M., & TRICOT, P., 1968, TOTAL EXPLORATION AUSTRALIA TICKALARA NO.1 WELL COMPLETION REPORT, BMR FILE 68/2042 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1565 Base Elevation: -1433 Thickness: 1561
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1628 Base Elevation: -1496 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1643 Base Elevation: -1511 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1685 Base Elevation: -1553 Thickness: 42
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1685 Base Elevation: -1553 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, ROSENEATH SH & EPSILON FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1711 Base Elevation: -1579 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1625* Thickness:)46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TILPAREE A-1

REFERENCE # C64

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELNI INT. OIL	RDH, WIRELINE	SH/54-2	28 30'10"S	140 38'20"E		+46	-2094	2140	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979
Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, DM R RECORD 1973/17 (UNPUB.); WILTSHIRE, MJ, 1975, BMR (UNPUB.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1722 Base Elevation: -1676 Thickness: 1722
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1762 Base Elevation: -1716 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1850 Base Elevation: -1804 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1874 Base Elevation: -1828 Thickness: 24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION C-C (THORNTON, 1979)

STRATIGRAPHY: ROSLNEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1904 Base Elevation: -1858 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION C-C (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:1962 Base Elevation: -1916 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2015 Base Elevation: -1969 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2090 Base Elevation: -2044 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION C-C (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2090 Base Elevation: -2044 Thickness: 328
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON Fm, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2131 Base Elevation: -2085 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION C-C (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X110
Basal Information: Depth to Base:ID Base Elevation: -2094# Thickness: >9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TINGA TINGANA 1

REFERENCE # C67

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI-SANTOS	RDH, CORE + WIRELINE	SH/54-6	29 00'45"S	140 05'38"E	+25	+31	-2271	2302	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 8 Publn Year:

Cross Reference: DELHI AUST. PET., 1968, DELHI-SANTOS TINGA-TINGANA NO.1 WELL COMPLETION REPORT, PNR FILE 68/2000 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1398 Base Elevation: -1367 Thickness: 1392
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1412 Base Elevation: -1381 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1684 Base Elevation: -1653 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1754 Base Elevation: -1723 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1754 Base Elevation: -1723 Thickness: 356
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1866 Base Elevation: -1835 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2271* Thickness:)436
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TIRRAWARRA 10

REFERENCE # C32

Organisation	Type	Name	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SG/54-14	27 38'42"S	140 09'49"E	+34	+40	-2999	3039	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, VERIFIED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GSSA BULLETIN 49; PETRUSHEVSKI, E., 1973, BMR RECORD 197 3/138 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2373 Base Elevation: -2333 Thickness: 2367
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2643 Base Elevation: -2603 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2688 Base Elevation: -2648 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2722 Base Elevation: -2682 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2736 Base Elevation: -2696 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2981 Base Elevation: -2941 Thickness: 245
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3022 Base Elevation: -2982 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3022 Base Elevation: -2982 Thickness: 379
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2999* Thickness: >17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TIRRAWARRA 5

REFERENCE # C33

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SG/54-14	27 42'11"S	140 07'23"E	+34	+39	-3039	3078	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Age: Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GSSA BULLETIN 49; PETRUSHEVSKI, E., 1973, BMR RECORD 197 3/138 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERONANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2362 Base Elevation: -2323 Thickness: 2357
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2614 Base Elevation: -2575 Thickness: 252
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2666 Base Elevation: -2627 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2687 Base Elevation: -2654 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: HURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2708 Base Elevation: -2669 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION A-A (THORNTON, 1979)

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:3016 Base Elevation: -2977 Thickness: 388
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3055 Base Elevation: -3016 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3055 Base Elevation: -3016 Thickness: 441
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -3039# Thickness: >23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TOOLACHEE 1

REFERENCE # C63

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI AUST. PET.	RDH, WIRELINE	SH/54-2	28 25'58"S	140 46'54"E		+56	-2147	2203	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; SMITH, K.G., ET AL., 1970, BMR RECORD 1970/37 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1738 Base Elevation: -1682 Thickness: 1738
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1792 Base Elevation: -1736 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1899 Base Elevation: -1843 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1916 Base Elevation: -1860 Thickness: 17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1975 Base Elevation: -1919 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2033 Base Elevation: -1977 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2085 Base Elevation: -2029 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2130 Base Elevation: -2074 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2130 Base Elevation: -2074 Thickness: 339
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:2140 Base Elevation: -2084 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION C-C (THORNTON, 1979)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2147# Thickness:)63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TOOLACHEE 5

REFERENCE # CS>	Organisation	Type	Hapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	DELHI INT. OIL	RDH, WIRELINE	SH/54-2	28 21'14"S	140 45'52"E		+67	-2219	2286	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, BM R RECORD 1973/17 (UNPUB.); WILTSHIRE, MJ, 1975, BMR (UNPUB.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1800 Base Elevation: -1733 Thickness: 1800
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1901 Base Elevation: -1834 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2014 Base Elevation: -1947 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2032 Base Elevation: -1965 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2091 Base Elevation: -2024 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2149 Base Elevation: -2082 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2202 Base Elevation: -2135 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2261 Base Elevation: -2194 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2261 Base Elevation: -2194 Thickness: 360
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2219* Thickness: >25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TOOLACHEE 6

REFERENCE # C61

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, WIRELINE	SH/54-2	28°24'14"S	140°50'03"E		+73	-2281	2354	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, SAGS BULLETIN 49; PETROLEUM TECHNOLOGY SECTION, 1973, DM R RECORD 1973/17 (UNPUB.); WILTSHIRE, MJ, 1975, BMR (UNPUB.)

SEDIMENTARY BASIN: COO. ER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1769 Base Elevation: -1696 Thickness: 1769
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1864 Base Elevation: -1791 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1996 Base Elevation: -1923 Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2030 Base Elevation: -1957 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2095 Base Elevation: -2022 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2164 Base Elevation: -2091 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2227 Base Elevation: -2154 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2346 Base Elevation: -2273 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION F-F (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2346 Base Elevation: -2273 Thickness: 481
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2281# Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TOOLACHEE EAST 1

REFERENCE # C60

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI INT. OIL	RDH, CORE + WIRELINE	SH/54-2	28 21'44"S	140 51'56"E	+73	+77	-2489	2566	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 8 Publn Year: 1979

Cross Reference: LUNT, C.X., 1972, TOOLACHEE EAST NO.1 WELL COMPLETION REPORT, BMR FILE 72/2643 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR (UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1311 Base Elevation: -1734 Thickness: 1807
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1920 Base Elevation: -1843 Thickness: 169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2069 Base Elevation: -1992 Thickness: 149
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2108 Base Elevation: -2031 Thickness: 39
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSENEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2195 Base Elevation: -2118 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2256 Base Elevation: -2179 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2316 Base Elevation: -2239 Thickness: 60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2551 Base Elevation: -2474 Thickness: 235
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2551 Base Elevation: -2474 Thickness: 631
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2489* Thickness:)15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WANCOOCHA 1

REFERENCE # C44

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELNI AUST. PET.	RDH, WIRELINE	SH/54-2	28°31'45"S	139°59'04"E		+37	-1944	1986	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979

Page: Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// SMITH, K.G., NICHOLAS, E., & RAINE, M.J., 1969, BMR RECORD 1969/153

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1710 Base Elevation: -1673 Thickness: 1710
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROSLNEATH SH Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1739? Base Elevation: -1702? Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ON LIST ROSENEATH SH NOT PRESENT & TOP OF PERMIAN AT 1739 M. THICKNESS TAKEN FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1779 Base Elevation: -1742 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS MEASURED ON SECTION EQUIVALENT TO THICKNESS GIVEN IN LIST

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1817 Base Elevation: -1780 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS MEASURED ON SECTION EQUIVALENT TO THICKNESS GIVEN IN LIST

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1905 Base Elevation: -1868 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION B-B (THORNTON, 1979)

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X106

Basal Information: Depth to Base:1905 Base Elevation: -1868 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1949* Thickness: >81
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WANTANA 1

REFERENCE # C27

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-14	27 37'59"S	140 25'33"E	+41	+48	-2894	2942	

REFERENCE: LIST OF FORMATION TOPS IN WANTANA NO 1 PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2272 Base Elevation: -2224 Thickness: 226S
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2523 Base Elevation: -2474 Thickness: 230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2565 Base Elevation: -2517 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2753 Base Elevation: -2705 Thickness: 188
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2779 Base Elevation: -2731 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP. Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2779 Base Elevation: -2731 Thickness: 257

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2907 Base Elevation: -2859 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2894* Thickness:)35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WEENA 1

REFERENCE # C68

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PEXA OIL-VAMGAS	RDH, CORE + WIRELINE	SH/54-6	29 05'38"S	139 50'51"E	+27	+30	-1614	1644	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 8 Publn Year: 1979

Cross Reference: BOWERING, D.J.W., 1978, PEXA OIL N.L. WEENA NO.1 WELL COMPLETION REPORT, BMR FIL E 70/485 (UNPUBL.)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: UNDIFF POST-PERMIAN Age: POST-PERMIAN Interpretation Code:X101
Basal Information: Depth to Base:1306 Base Elevation: -1276 Thickness: 1303
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1520 Base Elevation: -1490 Thickness: 214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1520 Base Elevation: -1490 Thickness: 214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS PATCHAWARRA FM

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1633 Base Elevation: -1603 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -1614# Thickness:)11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WELCOME LAKE 1

REFERENCE # C36

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-14	27 47'47"S	139 45'52"E	+23	+29	-2902	2931	

REFERENCE: LIST OF FORMATION TOPS IN WELCOME LAKE NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2313 Base Elevation: -2284 Thickness: 2307
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2421 Base Elevation: -2392 Thickness: 108
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2471 Base Elevation: -2442 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2482 Base Elevation: -2453 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2492 Base Elevation: -2463 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2806 Base Elevation: -2777 Thickness: 314

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2830 Base Elevation: -2801 Thickness: 24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2830 Base Elevation: -2801 Thickness: 409
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TODLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2902# Thickness:)101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WIMMA 1

REFERENCE # C24

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SG/54-14	27 21'19"S	140 33'16"E	+37	+43	-3667	3710	

REFERENCE: LIST OF FORMATION TOPS IN WIMMA NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page: Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:2687 Base Elevation: -2644 Thickness: 2681
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER TRIAS Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2890 Base Elevation: -2847 Thickness: 203
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:3169 Base Elevation: -3126 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:3276 Base Elevation: -3233 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:3282 Base Elevation: -3239 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:3313 Base Elevation: -3270 Thickness: 31

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:3615 Base Elevation: -3572 Thickness: 302
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:3657 Base Elevation: -3614 Thickness: 42
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:3657 Base Elevation: -3614 Thickness: 488
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM, TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:3698 Base Elevation: -3655 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X111
Basal Information: Depth to Base:TD Base Elevation: -3667* Thickness:)12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: WIRRARIE 1

REFERENCE # C41

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PEXA OIL N.L.	RDH, WIRELINE	SH/54-2	28 15'04"S	139 54'32"E		+29	-2183	2212	

REFERENCE: LIST OF FORMATION TOPS PROVIDED BY GEOLOGICAL SURVEY OF SOUTH AUSTRALIA, AMENDED USING CROSS-SECTION FROM THORNTON, 1979 AND WILTSHIRE, 1975 (BM K, UNPUBLISHED) Page: Publn Year:

Cross Reference: THORNTON, R.C.N., 1979, GEOL. SURV. STH. AUST. BULLETIN 49 /// SMITH, K.G., NICHOLAS, E., & RAINE, M.J., 1970, BMR RECORD 1970/37

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:1896 Base Elevation: -1867 Thickness: 1896
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:1909 Base Elevation: -1880 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1945 Base Elevation: -1916 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION D-D (THORNTON, 1979)

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1950 Base Elevation: -1921 Thickness: 5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS FROM CROSS-SECTION D-D (THORNTON, 1979)

STRATIGRAPHY: ROSLNEATH SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1982 Base Elevation: -1953 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2010 Base Elevation: -1981 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2039 Base Elevation: -2010 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2062 Base Elevation: -2033 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2062 Base Elevation: -2033 Thickness: 152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2183* Thickness:)150
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YANKO 1

REFERENCE # C73

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
DELHI PETROLEUM	RDH	SH/54-3	28 04'37"S	141 51'55"E	+72	+76	-2012	2088	

REFERENCE: LIST OF FORMATION TOPS IN YANKO NO.1, PROVIDED BY DELHI PETROLEUM PTY. LTD.

Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERONANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1785 Base Elevation: -1709 Thickness: 1781
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1864 Base Elevation: -1788 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DARALINGIE BEDS Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1887 Base Elevation: -1811 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: POOLOWANNA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1948 Base Elevation: -1872 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1965 Base Elevation: -1889 Thickness: 17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1981 Base Elevation: -1905 Thickness: 16

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2064 Base Elevation: -1988 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2064 Base Elevation: -1988 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, DARALINGIE BEDS, ROSENEATH SH, EPSILON FM, MURTEREE SH & PATCHAWARRA FM

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2612* Thickness:)24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YANPURRA 1

REFERENCE # C21

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FLINDERS PETROL.	RCH, CORE + WIRELINE	SG/54-14	27 20'19"S	140 49'15"E	+106	+112	-2849	2961	

REFERENCE: THORNTON, R.C.N.
REGIONAL STRATIGRAPHIC ANALYSIS OF THE GIDGEALPA GROUP, SOUTHERN COOPER BASIN, AUSTRALIA
GEOLOGICAL SURVEY OF SOUTH AUSTRALIA BULLETIN 49 Page FIG. 11 Publn Year: 1979

Cross Reference: LE GAY BRERETON, J., 1971, YANPURRA NO.1 WELL COMPLETION REPT, BMR FILE 70/758 (UNPUBLISHED); WILTSHIRE, M.J., 1975, BMR(UNPUBLISHED)

SEDIMENTARY BASIN: COOPER

STRATIGRAPHY: ERONANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X100
Basal Information: Depth to Base:2371 Base Elevation: -2259 Thickness: 2365
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NAPPAMERRI FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:2735 Base Elevation: -2623 Thickness: 364
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FORMATION PICK FROM WILTSHIRE, 1975

STRATIGRAPHY: TOOLACHEE FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2769 Base Elevation: -2657 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EPSILON FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2780 Base Elevation: -2668 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MURTEREE SH Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2791 Base Elevation: -2679 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PATCHAWARRA FM Age: PERMIAN Interpretation Code:X105

Basal Information: Depth to Base:2891 Base Elevation: -2779 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: TIRRAWARRA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2910 Base Elevation: -2798 Thickness: 19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GIDGEALPA GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2910 Base Elevation: -2798 Thickness: 175
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLACHEE FM, EPSILON FM, MURTEREE SH, PATCHAWARRA FM & TIRRAWARRA SST

STRATIGRAPHY: MERRIMELIA FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:2931 Base Elevation: -2819 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2849? Thickness:)30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

GALILEE

BASIN

CONTROL POINT: ALICE RIVER 1

REFERENCE # A34 Y1
REFERENCE # A34 X1
REFERENCE # A34 Y3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FARMOUT DRILLERS	RDM, CORE + WIRELINE	SF/55-13	23 37'08"S	145 19'15"E	+245	+269	-1362	1631	?

REFERENCE: X1 HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year 1981

Cross Reference:

REFERENCE: Y1 HARE, R., AND ASSOCIATES
FARMOUT DRILLERS N.L. ALICE RIVER NO.1 WELL, QLD., WELL COMPLETION REPORT
FARMOUT DRILLERS N.L. UNPUBLISHED REPORT. BMR FILE 62/1134 Page Publn Year: 1963

Cross Reference:

REFERENCE: Y3 NORVICK, M.
PERMIAN AND LATE CARBONIFEROUS PALYNOSTRATIGRAPHY OF THE GALILEE BASIN QUEENSLAND
BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS RECORD 1974/141 Page 18 Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code: X101
Basal Information: Depth to Base: 510 Base Elevation: -241 Thickness: 506
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code: X102
Basal Information: Depth to Base: 576 Base Elevation: -307 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code: X103
Basal Information: Depth to Base: 643 Base Elevation: -374 Thickness: 67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code: X104
Basal Information: Depth to Base: 765 Base Elevation: -496 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:796 Base Elevation: -527 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOWER BOUNDARY PICKED AT MARKED DEFLECTION IN SP & CHANGE IN RESISTIVITY (THIS REPORT)

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:860 Base Elevation: -591 Thickness: 64
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks LOWER BOUNDARY: SHARP DECREASE IN RESISTIVITY (THIS REPORT)

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1280 Base Elevation: -1019 Thickness: 428
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
TUFF, EDIE TF MB 980 -711 120
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -1362* Thickness: 1343
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -1352 Thickness: 1771
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS & JERICHO FM

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:18 Base Elevation: +251 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:234 Base Elevation: +35 Thickness: 216
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:510 Base Elevation: -241 Thickness: 276
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:576 Base Elevation: -307 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:829 Base Elevation: -560 Thickness: 253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1362M Thickness: >962
Geologic Description: F-VC QZ SST, COAL, CARB SH; SH WITH F-C SST; PBL CGL, F-M QZ SST; SLTST, LT-DK GY SH, INTBDD F-M SST, PBL CGL, LT GY-BLK SH, SLTST; PBL-CBL CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 2 SMS 831 -562 2.4
COAL 845 -576 0.9
Tectonic Structure: 832-916 M. DIPS 8-18 DEGREES
Remarks DIVIDED BY THE COMPANY INTO SIX LITHOLOGIC UNITS (AS ABOVE). TWO COAL SEAMS IN COAL INTERVAL ARE EACH 0.6 M THICK

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y301
Basal Information: Depth to Base:18 Base Elevation: +251 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y302
Basal Information: Depth to Base:510 Base Elevation: -241 Thickness: 492
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y303
Basal Information: Depth to Base:576 Base Elevation: -307 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y304
Basal Information: Depth to Base:753 Base Elevation: -484 Thickness: 177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y305
Basal Information: Depth to Base:856 Base Elevation: -587 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY - UPPER STAGE 5

STRATIGRAPHY: UNDIFF U.CARB-L.PERM Age: L.CARB-E.PERM Interpretation Code:Y306
Basal Information: Depth to Base:TD Base Elevation: -1362* Thickness: >775
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY - STAGE 1 TO LOWER STAGE 2

CONTROL POINT: ALLANDALE 1

REFERENCE # A51 Y1
REFERENCE # A51 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BEAVER-PEXA OIL	RDH, CORE + WIRELINE	SG/55-2	24 25'00"S	145 54'15"E	+375	+379	-2625	3004	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
LESLIE, W.C.
BEAVER EXPLORATION AUSTRALIA N.L. & PEXA OIL N.L. ALLANDALE NO.1 WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 70/823
Page Publn Year: 1971
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X161
Basal Information: Depth to Base:744 Base Elevation: -365 Thickness: 740
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1216 Base Elevation: -837 Thickness: 472
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1313 Base Elevation: -934 Thickness: 97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1344 Base Elevation: -965 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2149 Base Elevation: -1770 Thickness: 805
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:2256 Base Elevation: -1877 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:2771 Base Elevation: -2392 Thickness: 515
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:3003 Base Elevation: -2624 Thickness: 232
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2630* Thickness:)6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:181 Base Elevation: +198 Thickness: 177
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
DONCASTER MEMBER 181 +198 177
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:226 Base Elevation: +153 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y103

Basal Information: Depth to Base:504 Base Elevation: -125 Thickness: 278
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WESTBOURNE FM (226-300 M), ADORI SST (300-340 M) AND BIRKHEAD FM (340-504 M)

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:666 Base Elevation: -287 Thickness: 162
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:702 Base Elevation: -323 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:744 Base Elevation: -365 Thickness: 42
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:979 Base Elevation: -600 Thickness: 235
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1036 Base Elevation: -657 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1216 Base Elevation: -837 Thickness: 180
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: BANDANNA-BLACK ALLEY Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1313 Base Elevation: -934 Thickness: 97
Geologic Description: LT-M GY & BR SLTST WITH CARB & MICAC MAT, C'LESS-LT GY VF-F FAIRLY SORTED SSTS, LT-M GY, BR-DK GY & LT GN CARB MICAC SH, COAL, & MINOR TUFF
Reported Environment: SHALLOW FRESHWATER BASIN IN WHICH WATER LEVEL FLUCTUATED (LACUSTRINE). ON B'DARY BETWEEN SWAMPY ENVIRONMENT TO EAST & LACUSTRINE ENVIRON TO SW
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL SEAM	1219	-848	3 CA
POSSIBLE FM BOUNDARY	1267	-888	
TUFF	1294	-915	2 CA

Tectonic Structure:
Remarks REPPESENTS UNDIFFERENTIATED BANDANNA FM EQUIV AND BLACK ALLEY SHALE EQUIV. PALYNOSTRAT: UP. STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACK ALLEY SH EQUIV Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BLACK ALLEY SH EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1652 Base Elevation: -1273 Thickness: 339
Geologic Description: M-C C'LESS-WH FAIRLY SRTD MASSIVE QZ SSTS, M-DK GY MICAC CARB SLTSTS, VF-F QZOSE SST, M-DK GY & BLK MICAC CARB SH, & MINOR TFAC MATERIAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	1364	-985	3 CA
TUFF	1385	-1006	4 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:2149 Base Elevation: -1770 Thickness: 497
Geologic Description: UPPER ZONE (TO 1898 M): LT GY-GN GY SLTSTS WITH SH & MINOR M GR QZOSE SST. LOWER ZONE: C'LESS-LT GY VF-F CALC SST & INTBDD SLTSTS & SHALES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UPPER CARBONIFEROUS-LOWER PERMIAN AGE FROM PALYNOLOGY

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y115
Basal Information: Depth to Base:2771 Base Elevation: -2392 Thickness: 622
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:Y116
Basal Information: Depth to Base:3003 Base Elevation: -2624 Thickness: 232
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: SIL-DEVONIAN Interpretation Code:Y117
Basal Information: Depth to Base:TD Base Elevation: -2625* Thickness:)1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ALVA 1

REFERENCE # A60 Y1
REFERENCE # A60 Y2
REFERENCE # A60 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HARTOGEN EXPL.	RDH, CORE + WIRELINE	SG/55-5	25 12'31"S	145 23'14"E	+372	+376	-3208	3586	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
HAMILTON, N.J.
HARTOGEN EXPLORATIONS & AUSTRALIAN AQUITAINE PETROLEUM ALVA NO.1 WELL COMPLETION REPORT
UNPUBLSIHED COMPANY REPORT. BMR FILE 72/2633
Page Publn Year: 1973
Cross Reference:

REFERENCE: Y2
MATHUR, S.P., AND SEXTON, M.J.
CENTRAL EROMANGA BASIN SEISMIC SURVEY, QUEENSLAND, 1981: PREVIEW REPORT
BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS RECORD 1981/33
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code: X101
Basal Information: Depth to Base: 1578 Base Elevation: -1192 Thickness: 1564
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: X102
Basal Information: Depth to Base: 1665 Base Elevation: -1287 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code: X103
Basal Information: Depth to Base: 1743 Base Elevation: -1365 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code: X104
Basal Information: Depth to Base: 1885 Base Elevation: -1507 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1885 Base Elevation: -1507 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY. RUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X106
Basal Information: Depth to Base:2713 Base Elevation: -2335 Thickness: 828
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code X107
Basal Information: Depth to Base:3297 Base Elevation: -2919 Thickness: 584
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHALE/SILTSTONE MB 3098 -2720 385
BOREL SALT MEMBER 3297 -2919 199
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code X108
Basal Information: Depth to Base:3517 Base Elevation: -3139 Thickness: 220
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -3208# Thickness:)69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:823 Base Elevation: -445 Thickness: 817
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1013 Base Elevation: -635 Thickness: 190
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1105 Base Elevation: -727 Thickness: 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1146 Base Elevation: -768 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1282 Base Elevation: -904 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1512 Base Elevation: -1134 Thickness: 230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1654 Base Elevation: -1276 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1856 Base Elevation: -1478 Thickness: 202
Geologic Description: LT GY VF-C MOD SRTD SST; WH-LT GY F-M SST, BLK CARB MICROMICAC SH, BLK SUBVIT COAL; LT GY SH (LT GY SLTST, F SST LAMS), VF-M SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 1704 -1326 2
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. PALYNOLOGICAL ASSEMBLAGE AT 1725 M INDICATES AN UPPER PERMIAN AGE

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y109
Basal Information: Depth to Base:2627 Base Elevation: -2249 Thickness: 771
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:3297 Base Elevation: -2919 Thickness: 670
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:Y111
Basal Information: Depth to Base:3516 Base Elevation: -3138 Thickness: 219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASAL SST Age: DEVONIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -3208# Thickness:)70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y201
Basal Information: Depth to Base:823 Base Elevation: -445 Thickness: 817
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CADNA-OWIE FM Age: CRETACEOUS Interpretation Code:Y202
Basal Information: Depth to Base:906 Base Elevation: -528 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y203
Basal Information: Depth to Base:1013 Base Elevation: -635 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y204
Basal Information: Depth to Base:1282 Base Elevation: -984 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y205
Basal Information: Depth to Base:1512 Base Elevation: -1134 Thickness: 230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y206
Basal Information: Depth to Base:1654 Base Elevation: -1276 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1956 Base Elevation: -1578 Thickness: 302
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y208
Basal Information: Depth to Base:2713 Base Elevation: -2335 Thickness: 757
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y209
Basal Information: Depth to Base:3297 Base Elevation: -2919 Thickness: 584
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:Y210
Basal Information: Depth to Base:3516 Base Elevation: -3138 Thickness: 219

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code: Y211
Basal Information: Depth to Base: TD Base Elevation: -3208' Thickness: >70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: AOD JERICHO 1

REFERENCE # A39 Y1
REFERENCE # A33 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDH, CORE = WIRELINE	SF/55-14	23 46'19"S	146 05'01"E	+391	+396	-2390	2786	?

REFERENCE: X1 HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y1 BENEDEK, S.
ALLIANCE OIL DEVELOPMENT AUSTRALIA N.L. ALLIANCE JERICHO NO.1 WELL COMPLETION REPORT, A QUEENSLAND
UNPUBLISHED COMPANY REPORT. BMR FILE 65/4141 Page Publn Year: 1965
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:46 Base Elevation: 350 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:174 Base Elevation: 222 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:274 Base Elevation: 122 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X104
Basal Information: Depth to Base:396 Base Elevation: 0 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:449 Base Elevation: -53 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP PICKED WHERE SP RETURNS TO SHALE LINE

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:485 Base Elevation: -89 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: PEARWADDY FM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:518 Base Elevation: -122 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN TOP PICKED WHERE SP DEFLECTS FROM SHALE LINE

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:576 Base Elevation: -180 Thickness: 58
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks STAGE 5 (PROBABLY UPPER STAGE 5) MICROFLORA (NORVICK, 1974). FM IDENTIFIED BY HIGH RESISTIVITY

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:895 Base Elevation: -499 Thickness: 319
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ?UPPER STAGE 2 MICROFLORA AT 600-607 M (NORVICK,1974)

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:X110
Basal Information: Depth to Base:1594 Base Elevation: -1198 Thickness: 699
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
OAKLEIGH SLTST MB 1201 -805 107
Tectonic Structure:
Remarks STAGE 1-LOWER STAGE 2 (1092 M) & STAGE 1 (1219-1500 M) MICROFLORA (NORVICK, 19740

STRATIGRAPHY: LAKE GALILEE SST Age: CARBONIFEROUS Interpretation Code:X111
Basal Information: Depth to Base:1679 Base Elevation: -1283 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X112

Basal Information: Depth to Base:1679 Base Elevation: -1283 Thickness: 1103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS AND JERICHO FMS AND LAKE GALILEE SST

STRATIGRAPHY: VOLCANICLASTICS Age: CARBONIFEROUS Interpretation Code:X113
Basal Information: Depth to Base:TD Base Elevation: -2390* Thickness: >1107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:714 Base Elevation: +222 Thickness: 169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:348 Base Elevation: +48 Thickness: 174
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:396 Base Elevation: 0 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-BLACK ALLEY Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:484 Base Elevation: -88 Thickness: 80
Geologic Description: LT-DK GY SILTSTONE WITH INTRBD KAOLINITIC, CHLORITIC, MICACEOUS, CARBONACEOUS SANDSTONE & A BAND OF LT GY ARGILLACEOUS LIMESTONE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
LIMESTONE	412	-46	3.0
COAL	482	-86	2 CA

Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV + BLACK ALLEY SH EQUIV. CALLED BANDANNA FM EQUIV IN REF. ("OLD" BANDANNA)

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACK ALLEY SH EQUIV Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BLACK ALLEY SH EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:518 Base Elevation: -122 Thickness: 34
Geologic Description: LT GY CHLORITIC, CALCAREOUS, CARBONACEOUS SANDSTONE, UNDEKLAIN BY DK GREY CARBONACEOUS, MICACEOUS SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 504 -108 1 CA
COAL 509 -113 1 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:575 Base Elevation: -179 Thickness: 57
Geologic Description: LIGHT GREY CHLORITIC, MICACEOUS SANDSTONE WITH CARBONACEOUS BANDS 15 M BELOW TOP OF FORMATION
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL 541 -145 6 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1679 Base Elevation: -1283 Thickness: 1104
Geologic Description: SHALY SLTST, LI SST, CARB MICAC SLTST, SH-SLTST, LI SST; FINE BDD-LAMD SH, SH, F-MC SST; SLTST-MDST; VF-C QZ-LI SST, SH.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DIVIDED INTO SIX INFORMAL UNITS (AS ABOVE)

STRATIGRAPHY: DUCABROOK FM Age: CARBONIFEROUS Interpretation Code:Y110
Basal Information: Depth to Base:2704 Base Elevation: -2308 Thickness: 1025
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASAL SECTION Age: ? Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -2390* Thickness: 182
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : ARAMAC 1

REFERENCE # A22 Y1
REFERENCE # A22 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
QLD DEPT MINES	DDH, CORE + WIRELINE	SF/55-9	22 56'56"S	145 17'03"E	+220	+225	-1600	1825	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1 SWARBRICK, C.F.J., AND WALLIN, C.I.
WELL COMPLETION REPORT - QDH ARAMAC 1 AND HEXHAM 1
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 92

Page Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:357 Base Elevation: -132 Thickness: 352
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:551 Base Elevation: -326 Thickness: 194
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:645 Base Elevation: -420 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X104
Basal Information: Depth to Base:835 Base Elevation: -610 Thickness: 190
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:914 Base Elevation: -689 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1018 Base Elevation: -793 Thickness: 104
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1106 Base Elevation: -881 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1572 Base Elevation: -1347 Thickness: 466
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -1600* Thickness: >253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -1600* Thickness: >807
Geologic Descriptio
Reported Environme
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM, JOCHMUS FM & JERICHO FM

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:165 Base Elevation: +60 Thickness: 160
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RONLOW BEDS Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:357 Base Elevation: -132 Thickness: 192

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:551 Base Elevation: -326 Thickness: 194
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:645 Base Elevation: -420 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:835 Base Elevation: -610 Thickness: 190
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:914 Base Elevation: -689 Thickness: 79
Geologic Description: LT GY-LT GN GY VF-C POORLY SRTD LAB-SUBLAB SST, M-DK GY CARB MICAC SLTST, M-DK GY + BR FISSILE CARB MICAC SH, BLK-GY BLK BRITTLE BRIGHT COAL
Reported Environment: MANEROO PLATFORM, ARAMAC CM & RAVENSWOOD ARCH SUPPLIED METAMORPHIC, SEDIMENTARY & GRANITIC DETRITUS, RESPECTIVELY, TO THE ARAMAC AREA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SPORE ASSEMBLAGES - UPPER STAGE 5 (LATE PERMIAN)

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1018 Base Elevation: -793 Thickness: 104
Geologic Description: LT GY M-VC + PBLY FAIRLY-POORLY SRTD SUBLAB-QZOSE SSTS WITH ARG & PARTLY CALC MATRIX, BLK-GY BLK BRITTLE MAINLY DULL & DIRTY COAL, AND CGL
Reported Environment: MANEROO PLATFORM, ARAMAC CM & RAVENSWOOD ARCH SUPPLIED METAMORPHIC, SEDIMENTARY & GRANITIC DETRITUS, RESPECTIVELY, TO THE ARAMAC AREA
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SPORE ASSEMBLAGES - UPPER STAGE 5 (LATE PERMIAN)

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1106 Base Elevation: -881 Thickness: 88
Geologic Description: LT GY VF-M FAIRLY SRTD QZOSE-LAB SST, M-DK GY CARB V FINELY MICAC SLTST, GY, DK GY-BR FISSILE CARB V FINELY MICAC MDST, GY-BLK BRITTLE DULL COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1572 Base Elevation: -1347 Thickness: 466
Geologic Description: UPPER PART: F-C MOD-WELL SRTD SST, MDST + SLTST. EDIE TF: MDST, SLTST, TUFF, VF-F SST. LOWER PART: VF-C MOD-POORLY SRTD SST, SLTST, MDST, CGL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
EDIE TUFF MEMBER	1303	-1078	117

Tectonic Structure:
Remarks: UNIT IS VARIABLY TFAC, MICAC AND CARBONACEOUS. SPORE ASSEMBLAGE - STAGES 2 AND 3

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1600* Thickness: >253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: SPORE ASSEMBLAGE - STAGE 2

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -1600* Thickness: >807
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: CONTAINS ARAMAC CM, JOCHMUS FM & JERICHO FM

CONTROL POINT: BALFOUR 1

REFERENCE # A46 Y1
REFERENCE # A46 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMERICAN O/S PET	RDH, CORE + WIRELINE	SG/55-6	25 32'13"S	146 42'40"E	+451	+454	-1241	1695	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 GEHRARD, M.J.
AMERICAN OVERSEAS PETROLEUM LTD, BALFOUR 1, A.T.P. 181P, QUEENSLAND, WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 66/4262
Page Publn Year: 1966
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1036 Base Elevation: -582 Thickness: 1033
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1341 Base Elevation: -887 Thickness: 305
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1400 Base Elevation: -946 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1670 Base Elevation: -1216 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1670 Base Elevation: -1216 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: BASEMENT Age: SILURIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1241# Thickness:)25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:34 Base Elevation: +426 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:178 Base Elevation: +27b Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:330 Base Elevation: +124 Thickness: 152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:652 Base Elevation: -198 Thickness: 322
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:848 Base Elevation: -394 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:951 Base Elevation: -497 Thickness: 103

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1036 Base Elevation: -582 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER Fm Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1183 Base Elevation: -729 Thickness: 147
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1338 Base Elevation: -884 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-BLACK ALLEY Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1387 Base Elevation: -933 Thickness: 49
Geologic Description: DK GY-BLK CARB-COALY SILTY SH, LT-M GY SPECKLED CARB MICAC SLTST, LT GY-WH F-M SUBANGULAR CLEAR-MILKY QZ SST IN CALC MATRIX. SPORES + ACRITARCHS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENIATED BANDANNA FM + BLACK ALLEY SH. PALYNOSTRATIGRAPHIC STAGE - UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # BANDANNA FM NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # BLACK ALLEY SH NOT DIFFERENTIATED IN THIS INTERP. SEE PREVIOUS "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: PEAWADDY FM EQUIV Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:1401 Base Elevation: -947 Thickness: 14
Geologic Description: M-DK GY HARD FISSILE SL MICAC CARB CALC OFTEN SILTY PARTLY TFAC SHS, SIMILAR LT GY-GN SLTSTS, LT GY M-C + VC-GRANULAR QZ SSTS, PALE GN-GY CLST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SH + SLTST PREDOMINATE IN UPPER HALF + SST IS MORE COMMON IN LOWER HALF

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y114
Basal Information: Depth to Base:1670 Base Elevation: -1216 Thickness: 269
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHIC STAGE - STAGE 1 (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:Y115
Basal Information: Depth to Base:TD Base Elevation: -1241+ Thickness: >25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BARCOO 1

REFERENCE # AS2 Y1
REFERENCE # AS2 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Rot El	T.Dpth	status code
AUST. SUN OIL	RDH, CORE + WIRELINE	SF/55-1	24 17'09"S	145 08'18"E	+248	+253	-1463	1716	?

REFERENCE: X1 THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 GARRETT, G.W., AND PETERSEN, W.A.
AUSTRALIAN SUN OIL COMPANY LTD, BARCOO NO.1, WELL COMPLETION REPORT, A.T.P. 83P, QUEENSLAND
AUSTRALIAN SUN OIL CO. LTD, UNPUBLISHED REPORT. PMR FILE 68/2026 Page Publn Year: 1968
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1052 Base Elevation: -799 Thickness: 1047
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1145 Base Elevation: -892 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1186 Base Elevation: -933 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:X104
Basal Information: Depth to Base:1587 Base Elevation: -1334 Thickness: 401
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LAKE GALILEE SST Age: CARBONIFEROUS Interpretation Code:X105
Basal Information: Depth to Base:1709 Base Elevation: -1456 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: JOE JOE GP Age: CARBONIFERDUS Interpretation Code:X106
Basal Information: Depth to Base:1709 Base Elevation: -1456 Thickness: 523
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM & LAKE GALILEE SST

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X107
Basal Information: Depth to Base:ID Base Elevation: -1463* Thickness:)7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:576 Base Elevation: -323 Thickness: 571
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WINTON, TAMBO + ROMA FORMATIONS OF COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:668 Base Elevation: -415 Thickness. 92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF BLYTHESDALE GP OF COMPLETION REPORT

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:738 Base Elevation: -485 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF BLYTHESDALE GP OF COMPLETION REPORT

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:772 Base Elevation: -519 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF BLYTHESDALE GP OF COMPLETION REPORT

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:850 Base Elevation: -597 Thickness: 78

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1071 Base Elevation: -818 Thickness: 221
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1187 Base Elevation: -934 Thickness: 116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF U.CARB-L.PERM Age: L.CARB-E.PERM Interpretation Code:Y108
Basal Information: Depth to Base:1710 Base Elevation: -1457 Thickness: 523
Geologic Description: LT-M GY SILTY-SANDY MICAC PARTLY SL CALC SH, M-DK GY + ER GY PARTLY SILTY MICAC SH, LT GY-LT GN SL MICAC SIL SLTST, WELL SRTD BUT F-CGL SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
PAL STAGE 1; NORVICK 1532 -1279 316
Tectonic Structure:
Remarks ALSO CONTAINS WH-LT GY VF-M PARTLY FLD PY SL CALC SST. INTRBD. AGE DETERMINED USING PALYNOLOGY. STAGE 1 (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: DEVONIAN? Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -1463# Thickness: >6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BERYL 1

REFERENCE # A24 Y1
REFERENCE # A24 Y2
REFERENCE # A24 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ASSOC AUST OILFD	RGH, CORE + WIRELINE	SF/54-12	22 22'08"S	143 58'26"E	+265	+269	-997	1266	?

REFERENCE: Xi
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.A.O. BERYL NO.1 WELL, QUEENSLAND, WELL COMPLETION REPORT
ASSOC. AUST. OILFIELDS N.L. UNPUBL REPORT Q/66P/210. BMR FILE 64/4050
Page Publn Year: 1964
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:890 Base Elevation: -621 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:969 Base Elevation: -700 Thickness: 965
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: INCLUDES WALLOON CM

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:1000 Base Elevation: -731 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1102 Base Elevation: -833 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: B'DARY CRITERIA: TOP - INCREASE IN R, BASE - CHANGE IN PALYNOLOGY (SEE Y1), DECREASE IN R & GAMMA-RAY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1164 Base Elevation: -895 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF ARAMAC AT LAST COAL (ARBITRARY PICK)

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1234 Base Elevation: -965 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1234 Base Elevation: -965 Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & JOCHMUS FM

STRATIGRAPHY: BASEMENT Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -997 # Thickness:)32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:680 Base Elevation: -411 Thickness: 676
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WINTON FM, TAMBO FM, TOOLEBUC LST + ROMA FM OF COMPLETION REPORT

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:1000 Base Elevation: -731 Thickness: 320
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLYTHESDALE FM (680-835 M), WALLOON CM (835-893 M), + HUTTON SST (893-1000 M) OF COMPLETION REPORT

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:1109 Base Elevation: -840 Thickness: 109
Geologic Description: WH M-C POORLY SRTD ANGULAR QZ SST, WH M-C FAIRLY SRTD SUBROUNDED QZ SST, GY ARG FLD MICAC QZOSE SLTST, DK BR-BLK CARB SH, BLK VITREOUS COAL
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness	
COAL	1012	-743	2	CA
COAL	1027	-758	1	CA
COAL	1085	-816	2	CA
COAL INTERVAL	1107	-838	11	CA

Tectonic Structure:
Remarks: PALYNOSTRATIGRAPHIC STAGE: ?STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:1237 Base Elevation: -968 Thickness: 128
Geologic Description: F-C FAIRLY SRTD SUBROUNDED ARG MICAC QZOSE SST, WH C SUBANGULAR QZ SST (SOME LITHICS), GY ARG FLD AREN QZOSE SLTST, GY CARB SH, BLK CARB COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness	
COAL	1152	-883	1	CA
COAL	1161	-892	2	CA
COAL	1234	-955	1	CA

Tectonic Structure:
Remarks: PALYNOSTRATIGRAPHIC STAGE: UPPER STAGE 2-3 (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: DEVONIAN? Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -997 # Thickness: >29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:969 Base Elevation: -708 Thickness: 965
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1000 Base Elevation: -731 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks:

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1102 Base Elevation: -833 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV AND COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y285
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAHAC CM Age: PERMIAN Interpretation Code:Y286
Basal Information: Depth to Base:1164 Base Elevation: -895 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y287
Basal Information: Depth to Base:1234 Base Elevation: -965 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1224 -955 30
Tectonic Structure:
Remarks IDENTIFICATION OF EDIE TUFF MEMBER UNCERTAIN

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y288
Basal Information: Depth to Base:1234 Base Elevation: -965 Thickness: 132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAHAC CM & JOCHMUS FM

STRATIGRAPHY: METASEDIMENT Age: ? Interpretation Code:Y289
Basal Information: Depth to Base:TD Base Elevation: -997 * Thickness: 142
Geologic Description: RECRYSTALLISED SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BIRKHEAD 1

REFERENCE # A50

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
SOUTH PACIFIC	RDH	SG/55-2	24 36'34"S	146 23'27"E	+474	+479	-1101	1580	

REFERENCE: EXON, N.F., GALLOWAY, M.C., CASEY, D.J., & KIRKEGAARD, A.G. GEOLOGY OF THE TAMBO/AUGATHELLA AREA, QUEENSLAND BUREAU OF MINERAL RESOURCES REPORT 143. Page 102-103 Publn Year:

Cross Reference: NORVICK, M , 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:157 Base Elevation: +322 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:372 Base Elevation: +107 Thickness: 215
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:585 Base Elevation: -106 Thickness: 213
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:713 Base Elevation: -234 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DUNDA BEDS Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:797 Base Elevation: -318 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:872 Base Elevation: -393 Thickness: 75

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:893 Base Elevation: -414 Thickness: 21
Geologic Description: F DK GY MICAC NON-CALC SST, DK GY LIGNITIC SH, F LIGNITIC SST, & COAL SEAMS (P.29)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: PROBABLY UPPER STAGE 5 (AT 884 M) (NORVICK, 1974)

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:988 Base Elevation: -509 Thickness: 95
Geologic Description: GY ASH, DENSE IGNEOUS SEDS, GN UNCTUOUS SH, GY & TAN AREN LIMESTONE, CARB SHALE, VF DK GY SL CALCAREOUS SST-SANDY SHALE, & DK GY SHALE (P.28)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: PROBABLY UPPER STAGE 5 (930-960 M) (NORVICK, 1974)

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1036 Base Elevation: -557 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: PROBABLY UPPER STAGE 5; P3C AGE (AT 991 M) (NORVICK,1974)

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1359 Base Elevation: -880 Thickness: 323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY: STAGE 1 (AT 1097) (NORVICK, 1974)

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN-CARB Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -1101* Thickness: >221
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BONNIE 1

REFERENCE # ASB X1
REFERENCE # ASB Y1

Organisation	Type	Mapno	Lat	Leng	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	SG/55 S	25 00'43"S	145 22'01"E	+316	+328	-2425	2745	?

REFERENCE: X1

THIS REPORT

Page

Publn Year:

Cross Reference:

REFERENCE: Y1 KYRANIS, N.
PHILLIPS-SUNRAY BONNIE NO. 1, AUTHORITY TO PROSPECT 109P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL CO. UNPUBLISHED REPORT BMR FILE 66/4201 Page Publn Year: 1966

Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1385 Base Elevation: -1065 Thickness: 1381
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1459 Base Elevation: -1139 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1541 Base Elevation: -1221 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1624 Base Elevation: -1304 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1624 Base Elevation: -1304 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:2326 Base Elevation: -2006 Thickness: 782
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHALE/SILTSTONE MB 2225 -1905 601
BOREE SALT MEMBER 2326 -2006 101
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2425 Thickness: >419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:692 Base Elevation: -372 Thickness: 688
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TAMBO & ROMA FMS OF COMPLETION REPORT

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:965 Base Elevation: -645 Thickness: 273
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN COMPLETION REPORT

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1084 Base Elevation: -764 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN COMPLETION REPORT

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1319 Base Elevation: -999 Thickness: 235
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1422 Base Elevation: -1102 Thickness: 183
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1506 Base Elevation: -1186 Thickness: 84
Geologic Description: CORE 1: MH-GY, M-VC (PREDOM C), SUBANGULAR-ROUNDED, POORLY-MODERATELY SORTED SANDSTONE. POSSIBLE GRADED BEDDING
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
CORE 1	1471	-1151	5
COAL	1480	-1140	(1

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY PROBABLY UPPER STAGE 5 (AT 1476 M) (NORVICK, 1974)

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1757 Base Elevation: -1387 Thickness: 201
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY ?STAGE 1 (AT 1605 M) (NORVICK, 1974)

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y108
Basal Information: Depth to Base:1826 Base Elevation: -1506 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y109
Basal Information: Depth to Base:2326 Base Elevation: -2006 Thickness: 508
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -2425m Thickness:)419
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : BOREE 1

REFERENCE # A55 Y1
REFERENCE # A55 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMERICAN O/S PET	RDH, CORE + WIRELINE	SG/55-2	24 45'32"S	145 34'36"E	+333	+338	-2338	2676	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 GERRARD, M.J.
AMERICAN OVERSEAS PETROLEUM LTD BOREE NO.1, AUTHORITY TO PROSPECT 101P QLD, WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 64/4046
Page Publn Year: 1964
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: CALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1023 Base Elevation: -685 Thickness: 1018
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1154 Base Elevation: -816 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1222 Base Elevation: -884 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:NON-MARINE
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1358 Base Elevation: -1020 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:MAY BE PARTLY MARINE
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ANGULAR UNCONFORMITY AT BASE

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:2437 Base Elevation: -2099 Thickness: 1079
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	SHALE/SILTSTONE MB	1919	-1581	561
	SANDSTONE MEMBER	2437	-2099	518

Tectonic Structure:
Remarks

STRATIGRAPHY: COOLADDI DOLOMITE Age: DEVONIAN Interpretation Code:Y106
Basal Information: Depth to Base:2605 Base Elevation: -2267 Thickness: 168
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -2338* Thickness:)71
Geologic Description: RED BEDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:441 Base Elevation: -103 Thickness: 436
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:529 Base Elevation: -191 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:604 Base Elevation: -266 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:655 Base Elevation: -317 Thickness: 51
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:748 Base Elevation: -410 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1023 Base Elevation: -685 Thickness: 275
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS THE INTERVAL FROM HUTTON SST TO PRECIPICE SST

STRATIGRAPHY: CLEMATIS GP EQUIV Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1154 Base Elevation: -816 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1222 Base Elevation: -884 Thickness: 68
Geologic Description: LT-DK GY & BLK FISSILE-BLOCKY CARB MICAC PY PARTLY CALC SH WITH THINLY INTBDD SLTST & MASS CLST, & WH F-M WELL SRTD CARB PY SILTY & CLAYEY SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: 1212-1215 - PROBABLY UPPER STAGE 5; 1213-1222 - UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1358 Base Elevation: -1020 Thickness: 136
Geologic Description: INTBDD OFF WH-GY M-VF WELL SRTD CARB MICAC PY PARTLY CALC QZ-FLD SST (ARG MATRIX), M-DK GY SL CALC SLTST & SH, & BASAL C-CBL POLYMICTIC CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: 1327 M - STAGE 1 (NORVICK, 1974)

STRATIGRAPHY: UNDIFF MIDDLE DEVON Age: DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:1920 Base Elevation: -1582 Thickness: 562
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER DEVON Age: DEVONIAN Interpretation Code:Y111
Basal Information: Depth to Base:2605 Base Elevation: -2267 Thickness: 685
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF SILURIAN? Age: SILURIAN? Interpretation Code: Y112
Basal Information: Depth to Base: TD Base Elevation: -2338* Thickness: >71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BROOKWOOD 1

REFERENCE # A25 Y1
REFERENCE # A25 Y2
REFERENCE # A25 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Def El	Bot El	T.Dpth	status code
EXOIL N.L.	RDH, CORE + WIRELINE	SF/55-9	22 28'55"S	144 19'58"E	+224	+227	-1238	1465	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
PEMBERTON, R.L.
WELL COMPLETION REPORT EXOIL BROOKWOOD NO. 1
EXOIL NO LIABILITY UNPUBLISHED REPORT. BMR FILE 62/1122
Page Publn Year: 1962
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference.

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: WALLOON CM EQUIV Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:815 Base Elevation: -588 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:910 Base Elevation: -683 Thickness: 907
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES WALLOON CM EQUIV

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:1041 Base Elevation: -814 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:POINT BAR SANDS & DISTRIBUTARY CHANNEL FILL IN LOWER PART
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1177 Base Elevation: -950 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:UPPER DELTA PLAIN FLUVIAL DEPOSITION
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. TOP OF FM AT UPPERMOST COAL SEAM

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1342 Base Elevation: -1015 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE OF FM AT LOWERMOST COAL SEAM (DISTINGUISHABLE ON SP & R LOGS)

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1462 Base Elevation: -1235 Thickness: 220
Geologic Description:
Reported Environment:
Interpreted Environment:FLUVIAL - UPPER DELTA PLAIN
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1462 Base Elevation: -1235 Thickness: 285
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GROUP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -1238* Thickness:)3
Geologic Description: PORPHYRITIC ADAMELLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:636 Base Elevation: -409 Thickness: 633
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:713 Base Elevation: -486 Thickness: 77
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE GROUP IN COMPLETION REPORT

STRATIGRAPHY: WALLOON CM EQUIV Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:815 Base Elevation: -588 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:911 Base Elevation: -684 Thickness: 96
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1042 Base Elevation: -815 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BROOKWOOD BEDS IN COMPLETION REPORT

STRATIGRAPHY: BETTS CREEK BEDS Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1264 Base Elevation: -1037 Thickness: 222
Geologic Description: INTBDD COAL & M-VC PDORLY SRTD PARTLY ARKOSIC LITHIC MICAC CARB SST WITH CLAY CEMENT, & MINOR m-DK GY & BR CARB PARTLY SANDY SHALE & SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: 2 SMS	1052	-825	11 CA
COAL INTERVAL	1149	-922	64 CA
COAL INTERVAL	1204	-977	32 CA
COAL INTERVAL	1243	-1016	20 CA

Tectonic Structure:
Remarks 1 M COAL SEAM AT 1059 M DEPTH. PALYNOLOGICAL ASSEMBLAGE INDICATES AN UPPER PERMIAN AGE (UPPER STAGE 5 - NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1462 Base Elevation: -1235 Thickness: 198
Geologic Description: SST, SH, SLTST SEQ SIMILAR TO ABOVE BUT WITH ONLY MINOR COAL. SST MORE ARKOSIC + MICAC WITH DEPTH. LOWER 17 M: M-C V ARK MICAC LI SST - PBL CGL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1339	-1112	26 CA
PLAYNOLOGICAL SAMPLE	1352	-1125	
PALYNOLOGICAL SAMPLE	1446	-1219	

Tectonic Structure:
Remarks 1314-1338: SUGGESTIVE OF WEATHERED ZONE; MAY INDICATE DEPOSITIONAL BREAK PALYNOSTRATIGRAPHY - STAGE 2 (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1238# Thickness:)3
Geologic Description: PORPHYRITIC ADAMELLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:910 Base Elevation: -683 Thickness: 907
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1041 Base Elevation: -814 Thickness: 131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1177 Base Elevation: -950 Thickness: 136
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV AND COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1242 Base Elevation: -1015 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:1462 Base Elevation: -1235 Thickness: 220
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1317 -1090 53
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1462 Base Elevation: -1235 Thickness: 285
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & JOCHMUS FM

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -1238+ Thickness:)3
Geologic Description: PORPHYRITIC ADAMELLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BRYNDERWYN 1

REFERENCE # A70

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO AUSTRALIA	RDH, CORE + WIRELINE	SG/55-2	24 38'10"S	145 32'34"E	+291	+298	-1550	1848	

REFERENCE: ESSO AUSTRALIA LTD
BRYNDERWYN NO. 1 WELL COMPLETION REPORT (CONFIDENTIAL) (UNPUBLISHED)

Page Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:960 Base Elevation: -662 Thickness: 953
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1046 Base Elevation: -748 Thickness: 86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:1188 Base Elevation: -890 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1270 Base Elevation: -972 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1800 Base Elevation: -1502 Thickness: 530
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:1832 Base Elevation: -1532 Thickness: 32

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevati: Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1550# Thickness:)16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: BUCKLAND NS 2

REFERENCE # A44

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH. CORE + WIRELINE	SG/55-3	24 37'34"S	147 33'22"E	+449	+449	+271	178	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, SPRINGSURE SHELF PROGRAMME, WESTERN BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/37 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:6 Base Elevation: +443 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:46 Base Elevation: +403 Thickness: 40
Geologic Description: LT GY LAB SST WITH RARE QZ PBLS + BIOTITE FLAKES, PARTLY SILTY MDST WITHBIOT FLAKES + NUMEROUS CARB + PLANT FRAGMENTS, + SILTSTONES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:46 Base Elevation: +403 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SM Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:99 Base Elevation: +350 Thickness: 53
Geologic Description: CALC SST WITH CARB PARTINGS, SLST WITH CARB PARTINGS, INTBDD SLTST + MDST, CALC TUFFACEOUS MDST, + OOLITIC LIMESTONE. SST LABILE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DIPS 1-2 DEGREES

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:165 Base Elevation: +284 Thickness: 66
Geologic Description: LAB SST, CALC IN PART WITH A FEW GY SLTST BDS, CALC TFAC SLTST, + PARTLY TFAC MDST. MARINE FOSSILS. UPPER SECTION ARENACEOUS, LOWER SECTION ARG.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHELLY FOSSILS SECT. 140 +309 30
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106

Basal Information: Depth to Base:165 Base Elevation: +284 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: +271 ± Thickness: >13
Geologic Description: LAR M GR SST WITH NUM IRREG MDST + SLTST BEDS, INTBDD? ORG DISTURBED SLTST + SST, + F-M LT GY QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: +271 ± Thickness: >13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +271 ± Thickness: >132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM + GEBBIE SUB-GROUPS (AS ABOVE)

CONTROL POINT: BUCKLAND NS 3

REFERENCE # A43

Organisation	Type	Mapno	Lat	Lang	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD	DDH, CORED	SG/55-3	24 31'08"S	147 23'45"E	+351	+351	+192	159	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, SPRINGSURE SHELF PROGRAMME, WESTERN BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/37 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: CALILEE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:25 Base Elevation: +326 Thickness: 25
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:98 Base Elevation: +253 Thickness: 73
Geologic Description: LT GY F LAB SST WITH CARB + PLT FRAGS + COAL INTBDS, F LAB TFAC CALC SST, LT GY F-M LAB-SUBLAB + GY-GN TFAC MICAC VF-F LAB SSTS, GY SLTST, COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	27	+324	1.5

Tectonic Structure:
Remarks SLTST ALSO CONTAINS PLANT FRAGMENTS & IS SLUMPED. PLT FRAGS (SPHENOPTERIS) & ?WORM BURROWS NEAR BASE

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:98 Base Elevation: +253 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:136 Base Elevation: +215 Thickness: 38
Geologic Description: LT GY-GN TFAC ?BIOTURB SST, LT GY-GY TFAC SILTY MDST, GY + GN PARTLY TFAC MUDSTONE WITH SOME SLTST BEDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: +192 * Thickness: >23
Geologic Description: LT GY-GY F LAB PARTLY TFAC SST WITH A FEW PBLS + ORG BURROWS, INTBDD ?ORG DISTURBED SST + SLTST, + LT GY-GY SLTST + MDST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
R marks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106

Basal Information: Depth to Base:TD Base Elevation: +192 E Thickness: >61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH + PEAWADDY FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: +192 E Thickness: >61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM SUB-GROUP

CONTROL POINT: BURY 1

REFERENCE # A59 Y1
REFERENCE # A59 X1

Organisation	Type	Mapno	Lat	Leng	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	SG/55-6	25 02'40"S	145 36'20"E	+329	+333	-2411	2744	?

REFERENCE: X1 THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 PATTERSON, W.A.
PHILLIPS-SUNRAY BURY NO. 1, AUTHORITY TO PROSEPCT 109P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL CO. UNPUBLISHED REPORT. BMR FILE 66/4192 Page Publn Year: 1966
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: ERONANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1219 Base Elevation: -886 Thickness: 1214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1303 Base Elevation: -970 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1402 Base Elevation: -1069 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1609 Base Elevation: -1276 Thickness: 207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:2359 Base Elevation: -2026 Thickness: 750
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
BGREE SALT MB 2359 -2826 586
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:X186
Basal Information: Depth to Base:2645 Base Elevation: -2313 Thickness: 285
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:2720 Base Elevation: -2387 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2411% Thickness:)24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:540 Base Elevation: -207 Thickness: 532
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOOKAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:674 Base Elevation: -341 Thickness: 134
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:749 Base Elevation: -416 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104

Basal Information: Depth to Base:815 Base Elevation: -462 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:943 Base Elevation: -610 Thickness: 128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1178 Base Elevation: -845 Thickness: 235
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DISCONFORMITY AT BASE

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1305 Base Elevation: -972 Thickness: 127
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DISCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1402 Base Elevation: -1069 Thickness: 97
Geologic Description: RD BR STICKY & GY SILTY CLSTS & INTBDS SST & THIN COAL SM, WH-GY & GN F-M SUBRND MOD SRTD QZ SST WITH TRACE PY & THIN INTBDS GY PY SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAM 1327 -994 2.5 CA
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5 (NORVICK, 1974). DISCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1609 Base Elevation: -1276 Thickness: 207
Geologic Description: UPPER PART: WH-GY-GN C SUBRND QZ SST, GY SLTST & LT-DK GY DR PY SH. LOWER PART: POORLY SRTD F-M QZ SST WITH INTBDD GY GN CARB PY SH & SLTSTS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: STAGE 1 (AT 1437 + 1551 M) (NORVICK, 1974). MAJOR UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF DEVONIAN Age: DEVONIAN Interpretation Code:Y11d
Basal Information: Depth to Base:TD Base Elevation: -2411± Thickness: >1135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

CONSISTS OF ETONVALE FM (ETONVALE D-2, BOREE SALT & LURY LIMESTONE MEMBERS) & LOWER DEVONIAN UNNAMED SST (2647 M-TD)

CONTROL POINT: CARLOW 1

REFERENCE # AS6 Y1
REFERENCE # AS6 Y2
REFERENCE # AS6 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	SG/55-1	24 50'27"S	145 25'48"E	+280	+285	-3381	3666	?

REFERENCE: X1
THIS REPORT
Page
Publn Year:
Cross Reference:

REFERENCE: Y1
KYRANIS, N.
PHILLIPS-SUNRAY CARLOW NO.1, AUTHORITY TO PROSPECT 109P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL COMPANY UNPUBLISHED REPORT. BMR FILE 64/4120
Page
Publn Year: 1964
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
MATHUR, S.P., AND SEXTON, M.J.
CENTRAL EROMANGA BASIN SEISMIC SURVEY, QUEENSLAND, 1981: PREVIEW REPORT
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS RECORD 1981/33
Page
Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1266 Base Elevation: -981 Thickness: 1261
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1392 Base Elevation: -1107 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1462 Base Elevation: -1177 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP PICKED AT SHARP INCREASE IN GAMMA AND FLAT SP, BASE AT CHANGES IN SP & GAMMA LOGS

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1678 Base Elevation: -1393 Thickness: 216
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks POSSIBLY JERICHO FM (OF JOE JOE GROUP)

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:1890 Base Elevation: -1605 Thickness: 212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
SHALE/SILTSTONE MB	1762	-1477	84
SANDSTONE MEMBER	1890	-1605	128

Tectonic Structure:
Remarks

STRATIGRAPHY: COOLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:1981 Base Elevation: -1696 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: LISSOY SST Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:2098 Base Elevation: -1813 Thickness: 117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:2972 Base Elevation: -2687 Thickness: 874
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -3381* Thickness: >694
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
RED BED UNIT	3423	-3138	451
VOLCANIC UNIT	TD	-3381*	>243

Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:624 Base Elevation: -339 Thickness: 619
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONSISTS OF TAMBO AND ROMA FORMATIONS OF COMPLETION REPORT

STRATIGRAPHY: HOORAY-ADORI Age: JURASSIC-CRET. Interpretation Code:Y102

Basal Information: Depth to Base:877 Base Elevation: -592 Thickness: 253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FORMATION IN COMPLETION REPORT

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1017 Base Elevation: -732 Thickness: 140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1213 Base Elevation: -928 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1265 Base Elevation: -980 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1390 Base Elevation: -1105 Thickness: 125
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1690 Base Elevation: -1405 Thickness: 300
Geologic Description: LT GY, GY-GN, GY-BR SL CARB PARTLY SILTY TRACE GLAUC SHALE WITH SOME INTBDD WH-LT GY VF-C MOD SORTED SST (MRG & SL CALC MATRIX)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY: ?STAGE 1 (AT 1678 M) (NORVICK, 1974)

STRATIGRAPHY: UNDIFF DEVONIAN Age: DEVONIAN Interpretation Code:Y108
Basal Information: Depth to Base:3423 Base Elevation: -3138 Thickness: 1733
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: BASEMENT Age: PRE-DEV E.CARBInterpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -3381± Thickness: >243
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y201
Basal Information: Depth to Base:625 Base Elevation: -340 Thickness: 620
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CADNA-OWIE FM Age: JURASSIC-CRET Interpretation Code:Y202
Basal Information: Depth to Base:684 Base Elevation: -399 Thickness: 59
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y203
Basal Information: Depth to Base:749 Base Elevation: -464 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y204
Basal Information: Depth to Base:850 Base Elevation: -565 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y205
Basal Information: Depth to Base:877 Base Elevation: -592 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y206
Basal Information: Depth to Base:1017 Base Elevation: -732 Thickness: 140
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y207
Basal Information: Depth to Base:1266 Base Elevation: -981 Thickness: 249
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y208
Basal Information: Depth to Base:1283 Base Elevation: -998 Thickness: 17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y209
Basal Information: Depth to Base:1390 Base Elevation: -1005 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1689 Base Elevation: -1404 Thickness: 299
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF DEVONIAN Age: DEVONIAN Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -3381# Thickness: >1977
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CHARTERS TOWERS 1

REFERENCE # A1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-2	20 12'11"S	145 54'55"E	+328	+329	+70	259	

REFERENCE: BALFE, P.E.
STRATIGRAPHIC DRILLING REPORT - GSQ CHARTERS TOWERS 1
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 81 (949) Page 542-549 Publn Year: 1980
Cross Reference: MCKELLAR, J.L., 1980, IN BALFE, 1980, QLD. GOVT. MIN. J. 81, 547-549

SEDIMENTARY BASIN: CALILEE

STRATIGRAPHY: CAMPASPE BEDS Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:71 Base Elevation: +258 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BOONDEROO BEDS Age: CARBONIFEROUS Interpretation Code:Y102
Basal Information: Depth to Base:254 Base Elevation: +75 Thickness: 183
Geologic Description: MUDSTONE, SILTSTONE, SANDSTONE, & MINOR CONGLOMERATE, CARBONACEOUS SHALE, WEATHERED ?TUFF, CALCAREOUS CLAYSTONE AND LIMESTONE
Reported Environment: A STRONG GLACIAL ASPECT IS EVIDENT THROUGHOUT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: 100 M - UPPER STAGE 2; 173-248 M - LOWER STAGE 2 (MCKELLER, 1980)

STRATIGRAPHY: GRANITE Age: ORD-DEVONIAN? Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: +70 # Thickness: >5
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CLAUDE NS 1

REFERENCE # A42

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SG/55-3	24 28'45"S	147 12'58"E	+375	+375	+194	181	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, SPRINGSURE SHELF PROGRAMME, WESTERN BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/37 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:16 Base Elevation: +359 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:89 Base Elevation: +286 Thickness: 73
Geologic Description: LT GY F LAB SST, PARTLY TFAC WITH CARB STREAKS, GY SLTST WITH MICA, INTBDD GY PARTLY TFAC MDST + SLTST, LT GY F-VF LAB PARTLY CALC + TFAC SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	17	+358	<1
LIMESTONE	61	+314	1

Tectonic Structure:
Remarks SSTS + SLTSTS CONTAIN PLANT FRAGMENTS

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:89 Base Elevation: +286 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:132 Base Elevation: +243 Thickness: 43
Geologic Description: INTBDD LT GY + GY SST + MDST, GY SLTST, GY GN PARTLY TFAC + CALC MDST, LT GY F WELL SRTD LAB SST, + GY MDST WITH TUFFACEOUS BEDS IN PLACES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:179 Base Elevation: +196 Thickness: 47
Geologic Description: LT GY-GY F WELL SRTD LAB CALC PARTLY TFAC SST, GY GN TFAC MDST, GY SLTST PARTLY TFAC WITH WORM BURROWS + MARINE FOSSILS, F-M POORLY SRTD LAB SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
BURROWS & FOSSILS	145	+230	

Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:179 Base Elevation: +196 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SHALE + PEAWADDY FM

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: +194 ± Thickness:)2
Geologic Description: LT GY, M GRAINED, POORLY SORTED SUB-LABILE TO QZOSE SST TENDING TO PEBBLE CONGLOMERATE AT BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: +194 ± Thickness:)2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: +194 ± Thickness:)92
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM + GEBBIE SUB-GROUPS

CONTROL POINT: CLAUDE NS 2

REFERENCE # A41

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-3	24 22'25"S	147 06'56"E	+412	+412	+237	175	

REFERENCE: ANDERSON, J.C.
DEPARTMENTAL DRILLING, SPRINGSURE SHELF PROGRAMME, WESTERN BOWEN BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/37 Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: CALILEE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:10 Base Elevation: +402 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:82 Base Elevation: +330 Thickness: 72
Geologic Description: LT GY-GN TFAC PARTLY CALC, PARTLY SILTY MDST, LT GY TFAC SLTST, LT GY-BR SLTST + MDST, GY F LAB ARENITE WITH CARB FRAGS, + LT GY VF LAB ARENITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: FRACT, SLICKED, BRECC. STEEP DIP IN PART
Remarks F ARENITE HAS CARB FRAGS, PLT DEBRIS + WORM BURROWS, + VF ARENITE HAS CARB LAMS. BOTH XBDD. DIP GENERALLY 5 DG

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:82 Base Elevation: +330 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:115 Base Elevation: +297 Thickness: 33
Geologic Description: LT GY GN VF WELL SRTD LAB ARENITE WITH INTBDD MDST, LT GN GY SLTST, SY GN + CR TFAC MDST, + DK GY SHALE. PARALLEL BDG, WORM BURROWS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
LIMESTONE 107 +305 <1
Tectonic Structure: FAULTED + FRACTURED IN PARTS. DIPS 2 DG
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:169 Base Elevation: +243 Thickness: 54
Geologic Description: LT GY M QZOSE MASS-BDD ARENITE, GY SLTST, LT GN TFAC MDST, LT GN GY F QZOSE ARENITE, GY VF QZOSE ARENITE WITH SILTY BDS. WORM BURROWS, SOME XBDG
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHELLY FOSSILS. 116 +296
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:169 Base Elevation: +243 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SHALE + PEAWADDY FORMATION

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: +237 * Thickness:)6
Geologic Description: GY M-C GR QZOSE ARENITE, LT GY M GR QZOSE ARENITE + A FEW GY SLTST BEDS. ARENITES MODERATELY SORTED + MASSIVE + HAVE CLAY MATRIX
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: FRACTURED THROUGHOUT
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: +237 * Thickness:)6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: +237 * Thickness:)93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM + GEBBIE SUB-GROUPS

CONTROL POINT: COLLABARA 1

REFERENCE # A64 Y1
REFERENCE # A64 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RCH, CORE + WIRELINE	SG/55-5	25 14'23"S	144 45'00"E	+332	+337	-3592	3929	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
PHILLIPS-SUNRAY
PHILLIPS-SUNRAY COLLABARA NO.1 WELL COMPLETION REPORT
COMPANY REPORT (UNPUBLISHED)
Page Publn Year: 1966
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1889 Base Elevation: -1552 Thickness: 1894
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:2009 Base Elevation: -1672 Thickness: 120
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2265 Base Elevation: -1928 Thickness: 256
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X104
Basal Information: Depth to Base:3521 Base Elevation: -3184 Thickness: 1256
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:3878 Base Elevation: -3541 Thickness: 357
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	SHALE/SILTSTONE MB	3720	-3383	199
	SANDSTONE MB	3878	-3541	158

Tectonic Structure:
Remarks

STRATIGRAPHY: CODLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:3904 Base Elevation: -3567 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: LISSOY SST Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -3592* Thickness: >25
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:1259 Base Elevation: -922 Thickness: 1254
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY-ADORI Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:1568 Base Elevation: -1231 Thickness: 309
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: REPRESENTS UNDIFFERENTIATED HOORAY SST TO ADORI SST. CALLED BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1661 Base Elevation: -1324 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1889 Base Elevation: -1552 Thickness: 228
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMI Interpretation Code:Y105
Basal Information: Depth to Base:2009 Base Elevation: -1672 Thickness: 120
Geologic Description: WH-LT GY F-M + C POORLY-WELL SRTD MICAC SST WITH PATCHY WH ARG MTX, M-DK GY & BR PARTLY SILTY CARB SH, BR-GY MICAC CARB SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:2265 Base Elevation: -1928 Thickness: 256
Geologic Description: LT GY F-M FAIRLY-POORLY SRTD SL CALC PARTLY ARG SST, MULTICOL F-M POORLY SRTD SST, WH-ORANGE SILTY VF-M POORLY-FAIRLY SRTD SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN Interpretation Code:Y107
Basal Information: Depth to Base:3600 Base Elevation: -3263 Thickness: 1335
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -3592± Thickness: >329
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: COREENA 1

REFERENCE # A33 Y1
REFERENCE # A33 Y2
REFERENCE # A33 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	states code
BEAVER-PEXA OIL	RDH, CORE + WIRELINE	SF/55-13	23 18'53"S	145 23'19"E	+250	+254	-1333	1587	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
LESLIE, W.C.
COREENA NO. 1, WELL COMPLETION REPORT
BEAVER EXPL. AUST. N.L. PEXA OIL N.L. UNPUBL. REPORT. BMR FILE 70/162 Page Publn Year: 1970
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:303 Base Elevation: -49 Thickness: 299
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:668 Base Elevation: -414 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY? AT BASE

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:741 Base Elevation: -487 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment: FINING UP CYCLES MAY INDICATE DEPOSITION IN A FLUVIAL FLOOD PLAIN (OR UPPER DELTA PLAIN) ENVIRONMENT
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BOUNDARY CRITERIA: TOP - TOP OF COAL, CHANGE IN LOGS; BASE - BASE OF THICK COAL, CHANGE IN LOGS

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:809 Base Elevation: -555 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNIFORM SP. BASE PICKED AT CHANGE IN R & GAMMA LOGS. UNCONFORMITY AT BASE

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:872 Base Elevation: -618 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:POORLY DEFINED FINING UP SEQUENCES
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE PICKED AT DISTINCT CHANGE IN SP, R, GAMMA-RAY & BULK DENSITY LOGS

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1579 Base Elevation: -1325 Thickness: 707
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation ckness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1579 Base Elevation: -1325 Thickness: 770
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -1333# Thickness:)8
Geologic Description: PORPHYRITIC DACITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:83 Base Elevation: +171 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RONLOW BEDS Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:303 Base Elevation: -49 Thickness: 220
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:415 Base Elevation: -161 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:509 Base Elevation: -255 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEWAN GP Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:668 Base Elevation: -414 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:742 Base Elevation: -488 Thickness: 74
Geologic Description: LT-M GY QZOSE + FELDSPATHIC CARBONACEOUS SL CALCAREOUS SLTST, M-DK GY FISSILE SH, WH VF-F SST INTBDS + DULL-SHINY BLK COAL WITH PLANT FRAGMENTS
Reported Environment: RESTRICTED FRESH WATER LAKE WITH ALTERNATING ENERGY CONDITIONS FROM MODERATE TO LOW
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	669	-415	1 CA
COAL	680	-426	(1
COAL	689	-435	(1
COAL	738	-484	6.5 CA

Tectonic Structure:
Remarks: UPPER BOUNDARY IS AN UNCONFORMITY. PALYNOSTRATIGRAPHY: UPPER STAGE 5 (SAMPLE AT 671 M) (NORVICK, 1974)

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:809 Base Elevation: -555 Thickness: 67
Geologic Description: F-C SST WITH QZ + QZITE PBLS + INTBDD LT GY SL MICAC AREN SH, GY QZOSE ARG SL FLD + CARB MICAC SLTST, + COAL BEDS IN UPPER PART
Reported Environment: NON-MARINE ENVIRONMENT, VARYING FROM FLUVIATILE TO LACUSTRINE CONDITIONS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	757	-503	1.5 CA
COAL	790	-536	1 CA

Tectonic Structure:
Remarks: UNCONFORMITY AT BASE

STRATIGRAPHY: REIDS DOME BEDS Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:872 Base Elevation: -618 Thickness: 63
Geologic Description: INTBDD DK COLOURED CARB SHS, SLTSTS, COAL + MINOR F SST, + LT GY F-C SST WITH SOME DK GY MICAC SH, SLTST + COAL INTERBEDS
Reported Environment: UPPER PART: LOW ENERGY + RESTRICTED CONDITIONS. LOWER PART: INTERMITTENT PERIODS OF HIGH ENERGY (ALLOWING DEPOSITION OF COARSE SSTS)
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	813	-559	4 CA
COAL	825	-571	1 CA
COAL	844	-590	0.5 CA
COAL INTERVAL	850	-596	1 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y109

Basal Information: Depth to Base:1579 Base Elevation: -1325 Thickness: 787
Geologic Description: INTBDD LT-DK GY PARTLY SANDY MICAC SLTSTS, GY-GY BR SL CARB SH, DK GY VARVED SH, F-M + C'LESS-LT GY F-C QZOSE SSTS, + MINOR COLS + COL SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	887	-633	0.5 CA
COAL	897	-643	1 CA

Tectonic Structure:
Remarks: UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY: STAGE 2-3 (899 M), STAGE 2 (1388 M), ?STAGE 1 (1557 M) (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: SIL-DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1333* Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:303 Base Elevation: -49 Thickness: 299
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:415 Base Elevation: -161 Thickness: 112
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y203
Basal Information: Depth to Base:509 Base Elevation: -255 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y204
Basal Information: Depth to Base:668 Base Elevation: -414 Thickness: 159
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:741 Base Elevation: -487 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:809 Base Elevation: -555 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:849 Base Elevation: -595 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y208
Basal Information: Depth to Base:1269 Base Elevation: -1015 Thickness: 420
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1001 -747 129
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y209
Basal Information: Depth to Base:1579 Base Elevation: -1325 Thickness: 310
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
OAKLEIGH SLTST MB 1579 -1325 39
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1579 Base Elevation: -1325 Thickness: 770
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM, JOCHMUS FM + JERICHO FM

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -1333# Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CORFIELD 1

REFERENCE # A7 Y1
REFERENCE # A7 Y2
REFERENCE # A7 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
MAGELLAN PETROL.	RDH, CORE + WIRELINE	SF/54-8	21 42'46"S	143 22'30"E	+257	+258	-1116	1374	?

REFERENCE: EVANS, P.R.
THE STRATIGRAPHY OF MAGELLAN CORFIELD NO.1 BORE, GREAT ARTESIAN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS RECORD 1962/174 Page Publn Year: 1962
Cross Reference:

REFERENCE: HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981
Cross Reference:

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1071 Base Elevation: -813 Thickness: 1070
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1250 Base Elevation: -992 Thickness: 179
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1327 Base Elevation: -1069 Thickness: 77
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN. UNCONFORMITY AT BASE

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1368 Base Elevation: -1110 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION DOUBTFUL. BASED ON INCREASE IN GAMMA-RAY LOG. UNCONFORMITY AT BASE

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -1116* Thickness:)6
Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CRETACEOUS Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:724 Base Elevation: -466 Thickness: 723
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:879 Base Elevation: -621 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1085 Base Elevation: -827 Thickness: 206
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1250 Base Elevation: -992 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1368 Base Elevation: -1110 Thickness: 118
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRANITE Age: PRE-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1116* Thickness:)6
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:1071 Base Elevation: -813 Thickness: 1070
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1250 Base Elevation: -992 Thickness: 179
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1327 Base Elevation: -1069 Thickness: 77
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV AND COLINLEA SST EQUIV. DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1368 Base Elevation: -1110 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION OF THIS UNIT AS ARAMAC COAL MEASURES IS UNCERTAIN

STRATIGRAPHY: GRANITE Age: ? Interpretation Code:Y207
Basal Information: Depth to Base:TD Base Elevation: -1116* Thickness:)6

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: CUNNO 1

REFERENCE # A45 Y1
REFERENCE # A45 Y2
REFERENCE # A45 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
AMERICAN O/S PET	RDH, CORED, WIRELINE	SG/55-7	25 06'55"S	147 04'34"E	+547	+551	-311	862	?

REFERENCE: X THIS REPORT
Page Publn Year:
Cross Reference: DICKINS AND MALONE 1973, BMR BULLETIN 130

REFERENCE: Y1 GERRARD, M.J.
AMERICAN OVERSEAS PETROLEUM LTD CUNNO 1, A TO P 101P QUEENSLAND, WELL COMPLETION REPORT
AMERICAN OVERSEAS PETROLEUM LTD UNPUBL. REPORT BMR FILE 66/4203
Page Publn Year: 1966
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2 DICKINS, J.M., AND MALONE, E.J.
GEOLOGY OF THE BOWEN BASIN, QUEENSLAND
BUREAU OF MINERAL RESOURCES BULLETIN 130
Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:367 Base Elevation: +184 Thickness: 363
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:744 Base Elevation: -193 Thickness: 377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:800 Base Elevation: -249 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:800 Base Elevation: -249 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BANDANNA FM

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:833 Base Elevation: -282 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 15
Geologic Description:
Reported Environment: FLUVIAL (DICKINS AND MALONE 1973, 119)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROVISIONAL INTERPRETATION

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 15
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF BLENHEIM SUB-GP (UNDIFF.) AND COLINLEA SST OF GEBBIE SUB-GP

STRATIGRAPHY: VOLCANICS Age: DEVONIAN? Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -311* Thickness: >14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:6 Base Elevation: +545 Thickness: 2
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:367 Base Elevation: +184 Thickness: 361
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:744 Base Elevation: -193 Thickness: 377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-BLACK ALLEY Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:800 Base Elevation: -249 Thickness: 56
Geologic Description: INTBDD BLK-LT GY CARB FISSILE SH, SILTY SH, SLTST, LT GY-YEL VOLC ASH-TYPE CLST, RARE LT GY F-M TFAC SHALY SST; SH LAMD, WAVY BDG
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM + BLACK ALLEY SH. PALYNOSTRATIGRAPHY: UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BLACKWATER GP NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BLACK ALLEY SHALE NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:833 Base Elevation: -282 Thickness: 33
Geologic Description: INTBDD LT GY M-VC QZOSE SST WITH CALC CLAY MATRIX AND LT GY-GY CALC SL PY AND MICAC SH, AND QZOSE WELL SRTD CALC OR MARLY SST; BRACH FRAGS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: BASAL SST MB Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 15

Geologic Description: WH-LT GY M-VC GRAINED SL CALC VERY PYRITIC VERY POORLY SORTED QZOSE CONGLOMERATIC SST
Reported Environment: REPRESENTS TRANSGRESSION OVER POSITIVE BASEMENT FEATURE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks POSSIBLY THE LOWERHOST REPRESENTATIVE OF THE PEAWADDY FM

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF PEAWADDY FM AND BASAL SST MB (AND POSSIBLY UNDIFF BLACK ALLEY SH)

STRATIGRAPHY: BASEMENT Age: DEVONIAN? Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -311# Thickness: >14
Geologic Description: VOLCANICS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JURASSIC-CRET Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:367 Base Elevation: +184 Thickness: 363
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:744 Base Elevation: -193 Thickness: 377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:800 Base Elevation: -249 Thickness: 56
Geologic Description:
Reported Environment: FLUVIAL, LACUSTRINE OR PALUDAL (P.126)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 48
Geologic Description:
Reported Environment: MARINE (P.55)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:848 Base Elevation: -297 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF UNDIFFERENTIATED BLENHEIM SUB-GP

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:TD Base Elevation: -311* Thickness:)14
Geologic Description:
Reported Environment:
Interpreted Environment.
Geologic Features. Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: DARTMOUTH 1

REFERENCE # A68 Y1
REFERENCE # A68 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	SG/55-9	26 08'39"S	145 20'34"E	+336	+341	-2710	3051	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
KNUTH, B.W.
PHILLIPS-SUNRAY DARTMOUTH NO.1, AUTHORITY TO PROSPECT 109P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL CO. UNPUBLISHED REPORT. BMR FILE 66/4216
Page Publn Year: 1967
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:863 Base Elevation: -522 Thickness: 858
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:970 Base Elevation: -629 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:1080 Base Elevation: -739 Thickness: 110
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:1141 Base Elevation: -800 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:1223 Base Elevation: -882 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:1388 Base Elevation: -1047 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1556 Base Elevation: -1215 Thickness: 168
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:1835 Base Elevation: -1494 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:X109
Basal Information: Depth to Base:2198 Base Elevation: -1857 Thickness: 363
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOG CREEK FM Age: DEVONIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -2710* Thickness:)853
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
FINE SST, LST FACIES 2749 -2408 551
FINE SST FACIES TD -2710*)302
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:764 Base Elevation: -423 Thickness: 759
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:969 Base Elevation: -628 Thickness: 205
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO TRANSITION & MOOGA MEMBERS OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1085 Base Elevation: -744 Thickness: 116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED FOSSILWOOD MB OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1141 Base Elevation: -800 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED GUBBERAMUNDA MB OF BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1231 Base Elevation: -890 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1387 Base Elevation: -1046 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1556 Base Elevation: -1215 Thickness: 169
Geologic Description: INTBDD MULTICOLOURED M-C PARTLY CGL SUBANGULAR-ROUNDED UNCONSOLIDATED SST, WH-LT GY VF-F SST & WH-LT GY SANDY CLAY
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DISCONFORMITY AT TOP, MAJOR UNCONFORMITY AT BASE. PALYNOSTRAT.: 1395, 1423 M - U. STAGE 2, 1550 - ST. 2 (NORVICK, 1974)

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -2710# Thickness: >1495
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure
Remarks

CONTROL POINT: EASTWOOD 1

REFERENCE # A54 Y1
REFERENCE # A54 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bat El	T.Dpth	status code
ASSOC AUST OILFD	RDH, CORE + WIRELINE	SG/55-1	24 46'23"S	145 28'56"E	+277	+282	-3103	3385	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MINES ADMINISTRATION PTY. LTD.
A.A.O. EASTWOOD NO.1 WELL COMPLETION REPORT .
ASSOCIATED AUSTRALIAN OILFIELDS UNPUBL. REPT Q/83P/44D. BMR FILE 69/2024
Page Publn Year: 1970
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1491 Base Elevation: -1209 Thickness: 1486
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1522 Base Elevation: -1240 Thickness: 31
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:1604 Base Elevation: -1322 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X104
Basal Information: Depth to Base:1642 Base Elevation: -1360 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1710 Base Elevation: -1428 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1719 Base Elevation: -1437 Thickness: 9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:X107
Basal Information: Depth to Base:2058 Base Elevation: -1776 Thickness: 339
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
?OAKLEIGH SLTST MB 1867 -1585
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARBONIFEROUS Interpretation Code:X108
Basal Information: Depth to Base:2058 Base Elevation: -1776 Thickness: 339
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X109
Basal Information: Depth to Base:2752 Base Elevation: -2470 Thickness: 694
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X110
Basal Information: Depth to Base:2988 Base Elevation: -2706 Thickness: 236
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHALE/SILTSTONE MB 2847 -2565 95
SANDSTONE MEMBER 2988 -2706 141
Tectonic Structure:
Remarks

STRATIGRAPHY: COOLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X111
Basal Information: Depth to Base:3037 Base Elevation: -2755 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X112
Basal Information: Depth to Base:3183 Base Elevation: -2901 Thickness: 146
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X113
Basal Information: Depth to Base:TD Base Elevation: -3103* Thickness:)202
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
RED BED UNIT 3228 -2946 45
VOLCANIC UNIT TD -3103*)157
Tectonic Structure:
Remarks

STRATIGRAPHY: ALLUVIUM Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:9 Base Elevation: +273 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:829 Base Elevation: -547 Thickness: 820
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WINTON FM, MACKUNDA FM, ALLARU MDST, TOOLEBUC LST & WALLUMBILLA FM OF COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:1104 Base Elevation: -822 Thickness: 275
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1227 Base Elevation: -945 Thickness: 123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WESTBOURNE FM, ADORI SST & BIRKHEAD FM

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1506 Base Elevation: -1224 Thickness: 279
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1519 Base Elevation: -1237 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1654 Base Elevation: -1372 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1701 Base Elevation: -1419 Thickness: 47
Geologic Description: INTBDD LT-DK GY SL ARG LOCALLY SANDY FINELY MICAC CARB SLTST, M-DK GY-BR FISSILE SH (CARB PARTICLES, COAL LAM), WH-CLEAR VF-C POORLY SORTED SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: 1655 M - ?UPPER STAGE 5; 1667 M - UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:2058 Base Elevation: -1776 Thickness: 357
Geologic Description: WH-LT GY SL SIL-CALC F-C VARIABLY SRTD SST, LT-DK GY LOCALLY ARG COMM SANDY LOCALLY CARB SL CALC-SIL SLTST, LT GY-GY BR FISSILE MICAC SH, & CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REFERRED TO AS LOWER PERMIAN JOE JOE FM IN COMPLETION REPORT. UPPER STAGE 5 (1707 M); STAGE 1-2 (2027 M) (NORVICK, 1974)

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y110
Basal Information: Depth to Base:2750 Base Elevation: -2468 Thickness: 692
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF DEVONIAN Age: DEVONIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -3103# Thickness: >635
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ETONVALE & LOG CREEK FMS, "TRANSITION ZONE" & GUMBARDO FM EQUIV OF COMPLETION REPORT

CONTROL POINT: ETONVALE 1

REFERENCE # A62 Y1
REFERENCE # A62 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	56/55-5	25 09'40"S	144 59'40"E	+330	+334	-3131	3465	?

REFERENCE: X1 THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 LEWIS, J.H., AND KYRANIS, N.
WELL COMPLETION REPORT, PHILLIPS-SUNRAY ETONVALE NO.1, AUTHORITY TO PROSPECT 84P, QUEENSLAND
PHILLIPS PETROLEUM COMPANY UNPUBLISHED REPORT. BMR FILE 62/1079
Page Publn Year: 1962
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1671 Base Elevation: -1337 Thickness: 1667
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1721 Base Elevation: -1387 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1910 Base Elevation: -1576 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1910 Base Elevation: -1576 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X105
Basal Information: Depth to Base:2036 Base Elevation: -1702 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:2297 Base Elevation: -1963 Thickness: 251
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	SHALE/SILTSTONE MB	2141	-1807	105
	SANDSTONE MEMBER	2297	-1963	156

Tectonic Structure:
Remarks

STRATIGRAPHY: COOLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:2335 Base Elevation: -2001 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LISSOY SST Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:2507 Base Elevation: -2173 Thickness: 172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOG CREEK FM Age: DEVONIAN Interpretation Code:X109
Basal Information: Depth to Base:3057 Base Elevation: -2723 Thickness: 550
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	UPPER MEMBER	2908	-2574	401
	LOWER MEMBER	3057	-2723	149

Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X110
Basal Information: Depth to Base:3400 Base Elevation: -3066 Thickness: 343
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	RED BED UNIT	3304	-2970	247
	VOLCANIC UNIT	3400	-3066	96

Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: SILURIAN Interpretation Code:X111
Basal Information: Depth to Base:TD Base Elevation: -3131# Thickness: >65
Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:7 Base Elevation: +327 Thickness: 3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:1032 Base Elevation: -698 Thickness: 1025
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: NOORAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:1320 Base Elevation: -986 Thickness: 288
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO TRANSITION BEDS & HOOGA FM OF W.C.R.

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1419 Base Elevation: -1085 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO FOSSILWOOD BEDS OF W.C.R.

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1542 Base Elevation: -1208 Thickness: 123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO GUBBERAMUNDA FM OF W.C.R.

STRATIGRAPHY: UNDIFF JURASSIC Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1687 Base Elevation: -1353 Thickness: 145
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1721 Base Elevation: -1387 Thickness: 34

Geologic Description: WH-BUFF F SUBANG-SUBRND SST - ANG M-C-VC SST. ARGILLACEOUS CEMENT AT TOP BECOMING CLEANER. BLK SILTY CARB SL MICAC SHALE AT TOP & BASE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1910 Base Elevation: -1576 Thickness: 169
Geologic Description: LT-DK GY & BR SH PARTLY SILTY & CARB, INTBDD LT GY SLTST WITH DK SH LAMS, WH-GN VF-VC QZ LI SST, LT GY-WH POORLY SRTD F-PBL SST, GY-BLK SH T'OUT
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GY-BLK SH PRESENT AS THIN INTERBEDS

STRATIGRAPHY: UNDIFF DEVONIAN Age: DEVONIAN Interpretation Code:Y109
Basal Information: Depth to Base:2908 Base Elevation: -2574 Thickness: 998
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF SILURIAN Age: SILURIAN Interpretation Code:Y110
Basal Information: Depth to Base:3402 Base Elevation: -3068 Thickness: 494
Geologic Description.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: LATE SILURIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -3131# Thickness:)63
Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: FAIRLEA 1

REFERENCE # AS3 Y1
REFERENCE # AS3 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AUST. SUN OIL	RDH, CORE + WIRELINE	SG/55-1	24 29'50"S	145 19'52"E	+292	+297	-2823	3121	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1 GARRETT, G.W., AND PETERSEN, W.A.
AUSTRALIAN SUN OIL COMPANY LTD FAIRLEA NO.1 WELL COMPLETION REPORT, A.T.P.83P, QUEENSLAND
UNPUBLISHED COMPANY REPORT. BMR FILE 68/2010
Page Publn Year: 1968

Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1224 Base Elevation: -927 Thickness: 1219
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1366 Base Elevation: -1069 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1455 Base Elevation: -1158 Thickness: 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2021 Base Elevation: -1724 Thickness: 566
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-AXAMAC CM JOE JOE GP. UNCONFORMITY AT BASE

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X105
Basal Information: Depth to Base:2487 Base Elevation: -2190 Thickness: 466
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:2841 Base Elevation: -2544 Thickness: 354
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHALE/SILTSTONE MB 2661 -2364 174
SANDSTONE MEMBER 2841 -2544 180
Tectonic Structure:
Remarks

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:3034 Base Elevation: -2737 Thickness: 193
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -2823% Thickness:)86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:643 Base Elevation: -346 Thickness: 638
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WINTON, TAMBO & ROMA FMS OF COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:747 Base Elevation: -450 Thickness: 104
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:818 Base Elevation: -521 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:852 Base Elevation: -555 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:963 Base Elevation: -666 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1224 Base Elevation: -927 Thickness: 261
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1238 Base Elevation: -941 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1366 Base Elevation: -1069 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1455 Base Elevation: -1158 Thickness: 89
Geologic Description: DK GY SILTY (IN STREAKS) MICAC CARB SH WITH INTBDS LT GY F-M QZ SST WITH CARB PARTICLES. TRACE COAL, PY, CALCITE, ARAGONITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5 (AT 1417 M) (NORVICK, 1974)

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:2021 Base Elevation: -1724 Thickness: 566
Geologic Description: WH-LT GY F-M QZ SST, INTBDD WH-LT GY VF-F QZ SST & LT-DK GY PARTLY FINELY INTBDD-VARVED MICAC SH, DK GY-BR MICAC SH, LT GY F-VC & PBLY CGL SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY, UNDIFF STAGE 2 (NORVICK, 1974). ALSO CONTAINS THIN COAL & LIGNITE BANDS

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN Interpretation Code:Yiii
Basal Information: Depth to Base:2525 Base Elevation: -2228 Thickness: 504
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Yii2
Basal Information: Depth to Base:2797 Base Elevation: -2500 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GILMORE FM Age: DEVONIAN Interpretation Code:Yii3
Basal Information: Depth to Base:3036 Base Elevation: -2739 Thickness: 239
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: DEVONIAN? Interpretation Code:Yii4
Basal Information: Depth to Base:TD Base Elevation: -2823x Thickness:)84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 1

REFERENCE # A35 A

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE	SF/55-14	23 09'30"S	146 23'00"E	+335*	+335*	-4*	339	*Z

REFERENCE: CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - WENDOUREE AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/12 Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:47 Base Elevation: +288 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:58 Base Elevation: +277 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:226 Base Elevation: +109 Thickness: 168
Geologic Description: VF-C QZOSE (LOWER PART) & SUBLAB-LAB (UPPER PART) MICAC SSTS, LT-M GY CARB MDST, LT-M GY SLTST, COAL SEAMS WITH DK GY & FAWN MDSTS & CARB SHALE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: SM A	81	+254	5.3
COAL INTERVAL: SM B	98	+237	6.9
COAL INTERVAL: SM C	172	+163	8.4
COAL: SEAM D	190	+145	5.0

Tectonic Structure: FLAT-BEDDED
Remarks CONGLOMERATE AT BASE

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -4 * Thickness:)113
Geologic Description: LT GY-GN VF-C QZOSE (UPPER PART) & SUBLABILE-LABILE (LOWER PART) SST, AND MINOR PEBBLE CONGLOMERATE AND GN-GY MUDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 1,2

REFERENCE # A35 X1
REFERENCE # A35 Y1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	CDH, CORE + WIRELINE	SF/55-14	23 09'30"S	146 23'00"E	+335m	+335m	-312m	647	C

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - WENDOUREE AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/12
Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:47 Base Elevation: +288 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:58 Base Elevation: +277 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:257 Base Elevation: +78 Thickness: 199
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:460 Base Elevation: -125 Thickness: 203
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -312 + Thickness: >187
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:47 Base Elevation: +288 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:58 Base Elevation: +277 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:257 Base Elevation: +78 Thickness: 199
Geologic Description: SEE GALILEE NS 1 & GALILEE NS 2
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: SM A	81	+254	5.3
COAL INTERVAL: SM B	98	+237	6.9
COAL INTERVAL: SM C	172	+163	8.4
COAL: SEAM D	190	+145	5.0

Tectonic Structure:
Remarks COAL SEAM E: DEPTH 232 M, ELEVATION +103 M, THICKNESS 2.1 M. FOR COAL DATA SEE GALILEE NS 1 AND GALILEE NS 2

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:460 Base Elevation: -125 Thickness: 203
Geologic Description: SEE GALILEE NS 1 & GALILEE NS 2
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -312 * Thickness: >187
Geologic Description: SEE GALILEE NS 2
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 10

REFERENCE # A19 AY
REFERENCE # A19 AX

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-10	22 25'45"S	146 26'08"E	+260*	+260*	-137*	397	*Z?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - LAGLAN AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/12
Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINJZOIC Interpretation Code:X101
Basal Information: Depth to Base:75 Base Elevation: +185 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:233 Base Elevation: +27 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:373 Base Elevation: -113 Thickness: 140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -137 * Thickness: >24
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:75 Base Elevation: +185 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:233 Base Elevation: +27 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:373 Base Elevation: -113 Thickness: 140
Geologic Description: LT GY F-M LAB SST (UPPER PART), C QZOSE SST WITH SCATTERED PBLS (LOWER PART), COAL SEAMS, MINOR GY CARB MUDSTONE, & SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SEAM A+B	246	-220	12 CA
COAL: SEAM C	326	-308	9 CA
COAL: SEAM D	339	-321	7 CA
COAL: SEAM F	351	-333	3 CA

Tectonic Structure:
Remarks SEAM E: DEPTH 345 M, ELEVATION -327 M, THICKNESS 2 M CA

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -137 * Thickness: >24
Geologic Description: LT-M GY TUFF, DK GN TFAC MDST, GN GY-GN TFAC SLTST, LT GY-GN F-VC LAB ?TFAC SST WITH CARB FRAGS & COALY LENSES
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 10,8

REFERENCE # A19 Y1
REFERENCE # A19 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-10	22 25'45"S	146 26'08"E	+268m	+268m	-497m	757	C?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - LAGLAN AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/12
Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:75 Base Elevation: +185 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:233 Base Elevation: +27 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:373 Base Elevation: -113 Thickness: 140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -497 * Thickness:)384
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:75 Base Elevation: +185 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FROM GALILEE NS 10. * SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:233 Base Elevation: +27 Thickness: 158
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FROM GALILEE NS 10

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:373 Base Elevation: -113 Thickness: 140
Geologic Description: SEE GALILEE NS 10
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL: SEAM A+B	246	-228	12 CA
	COAL: SEAM C	326	-308	9 CA
	COAL: SEAM D	339	-321	7 CA
	COAL: SEAM F	351	-333	3 CA

Tectonic Structure:
Remarks FROM GALILEE NS 10

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -497 * Thickness:)384
Geologic Description: SEE GALILEE NS 8
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks FROM GALILEE NS 8

CONTROL POINT: GALILEE NS 1SR

REFERENCE # A36 Y1
REFERENCE # A36 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-14	23 31'07"S	146 20'00"E	+358	+358	+77	281	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - LAMBTON MEADOWS AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/31
Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:76 Base Elevation: +282 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:145 Base Elevation: +213 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:168 Base Elevation: +190 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:190 Base Elevation: +168 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:265 Base Elevation: +93 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: +77 * Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:76 Base Elevation: +282 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GROUND ELEVATION QUOTED ABOVE IS APPROXIMATE

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:141 Base Elevation: +217 Thickness: 65
Geologic Description: LT GY & LT BR F LAB MICAC SST, CALC IN PARTS WITH SOME CARB FRAGS, MINOR GY SLTST BEDS NEAR BASE, COAL SEAM
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL: SEAM B 102 -256 2 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH EQUIV Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:168 Base Elevation: +190 Thickness: 27
Geologic Description: LT GY, GY & DR TFAC MDST AT TOP & BOTTOM, LT GY F LAB SST, & DK GY SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM EQUIV Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:190 Base Elevation: +168 Thickness: 22
Geologic Description: LT GY F SUB-LABILE MICAC SST WITH GY SLTST INTERBEDS & COAL SEAM (WITH MINOR MUDSTONE)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL: SEAM C 186 +172 2.5 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:265 Base Elevation: +93 Thickness: 75
Geologic Description: LT GY C QZOSE POROUS PARTLY MICAC SST WITH CARB FRAGS & PBLS, LT GY SUBLAB F-M SST (CARB & MICAC PRTGS), MINOR BEDS, LAM DK GY SLTST, COAL, CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL: SEAM D TOP 202 +156 1 CA
COAL: SEAM D 217 +141 2 CA
Tectonic Structure:

Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: +77 E Thickness: >16
Geologic Description: GREY FINE TUFFACEOUS SANDSTONE, CONGLOMERATE AND LIGHT GREY TO WHITE FINE SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 2

REFERENCE # A35 BY
REFERENCE # A35 BX

Organisation	Type	Maono	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-14	23 10'00"S	146 26'00"E	+320#	+320#	-263#	583	#

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - WENDOUREE AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/12
Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:X101
Basal Information: Depth to Base:46 Base Elevation: +274 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:193 Base Elevation: +127 Thickness: 147
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:396 Base Elevation: -76 Thickness: 203
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -263 # Thickness: >187
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:46 Base Elevation: +274 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:193 Base Elevation: +127 Thickness: 147
Geologic Description: F-C QZOSE (LOWER PART) & SUBLAB (UPPER PART) MICAC SSTS, GY SLTST & MDST, COAL SEAMS WITH CARB SH & DK GY MDST, & PEBBLE CONGLOMERATE AT BASE
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: SM C	103	+217	9.1
COAL INTERVAL: SM D	126	+194	5.6
COAL: SM E	168	+152	2.1

Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:396 Base Elevation: -76 Thickness: 203
Geologic Description: LOWER PART: LT GY & GN F-M & PBLY SUBLAB SST. MIDDLE PART: LT GY M QZOSE SST. UPPER PART: LT GY-WH M QZOSE SST WITH CLAYEY MATRIX
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -263 * Thickness: 187
Geologic Description: LT GN & LT GY F-M LAB-SUBLAB (SOME QZOSE IN LOWER PART) MICAC SSTS, MINOR GN-GY-BLK MDSTS (WITH CARB FRAGS), PBL BEDS & SLTST. ALL PARTLY TFAC
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 21

REFERENCE # A17 Y1
REFERENCE # A17 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-10	22 01'36"S	146 20'11"E	+253	+253	-1	254	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - MORAY DOWNS AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/28
Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:45 Base Elevation: +208 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:86 Base Elevation: +167 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:238 Base Elevation: +15 Thickness: 152
Geologic Description: APPROX. 31% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1 * Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GROUP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:45 Base Elevation: +208 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:86 Base Elevation: +167 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:239 Base Elevation: +14 Thickness: 153
Geologic Description: LT GY F & M LAB MICAC SST WITH CARB PARTINGS, GY FAWN OR CARBONACEOUS MDST, COAL SEAMS, AND MINOR SLTST. TUFFACEOUS IN PARTS
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SEAM A-B	105	+148	12 CA
COAL: SEAM C	173	+80	8 CA
COAL: SEAM D	181	+72	6 CA
COAL: SEAM F	235	+18	5 CA

Tectonic Structure:
Remarks SEAM B SPLIT: DPTH 129, ELEV +124, THICK 1 CA. SEAM E: DPTH 222, ELEV +31, THICK 3 CA.

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -1 * Thickness: >15
Geologic Description: LT GY, LT & DK GN, FINE, LABILE, PARTLY TUFFACEOUS SANDSTONE AND MINOR DENSE DK GN TUFFACEOUS SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 24

REFERENCE # A15 Y1
REFERENCE # A15 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-6	21 25'52"S	146 02'27"E	+339	+339	+58	281	1

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - MIRTNA AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1976/4
Page Publn Year: 1976
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:22 Base Elevation: +317 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER TRIAS Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:49 Base Elevation: +290 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:220 Base Elevation: +119 Thickness: 171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV. UNCONFORMITY AT BASE

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOE JOE GP Age: EARLY PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: +58 * Thickness:)61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:22 * Base Elevation: +317 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * DEPTH TO BASE UNCERTAIN; OCCURS IN OPEN-HOLED SECTION

STRATIGRAPHY: UNDIFF LOWER TRIAS Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:49 Base Elevation: +290 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:220 Base Elevation: +119 Thickness: 165
Geologic Description: UPPER PART: LT GY GN-GY F-M L&B SST, INTBDS OF LT-DK GY SILTY MDST, COAL. LOWER PART: LT GY-WH M-VC PBLY QZOSE SST, COAL & MDST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SM C & SPLIT	134	+205	15
COAL: SEAM D	190	+149	9
COAL: SEAM E	197	+142	5
COAL: SEAM F	212	+127	7

Tectonic Structure: DIPS RANGE FROM 10-25 DEGREES
Remarks SEAM C (AT 124 M) IS APPROX 3 M THICK AND THE SPLIT IS APPROX 2 M THICK.THICKNESS CORRECTED FOR DIP

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: +58 * Thickness:)61
Geologic Description: WH, LT GY, GN LABILE F GR RARELY PEBBLEY SST WITH CARBONACEOUS PARTINGS, LT-DK GY & M-DK GN TFAC MDST, AND RARE SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 29

REFERENCE # A16 Y1
REFERENCE # A16 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-6	21 43'08"S	146 09'28"E	+364	+364	+68	296	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - VIEW HILL AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1977/11
Page Publn Year: 1977
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:98 Base Elevation: +266 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:273 Base Elevation: +91 Thickness: 175
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: +68 # Thickness: >23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:98 Base Elevation: +266 Thickness: 98
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:273 Base Elevation: +91 Thickness: 175
Geologic Description: M-LT GY VF-M GR LAB & SUBLAB SST, C QZOSE & MICAC SST, ARENITES WITH MDST FRAGS, M-DK GY MDST & SLTST, & COAL WITH FAWN MDST INTBDS
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL, SEAM A-B	166	+198	23.8
COAL, SEAM D	221	+143	5.5
COAL, SEAM E TOP	226	+138	1.8
COAL, SEAM F	255	+109	4.9

Tectonic Structure:
Remarks: SEAM C: DEPTH 180 M, THICKNESS 10.5 M. SEAM E BTM: DEPTH 237 M, THICKNESS 1.2 M

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code: Y103
Basal Information: Depth to Base: TD Base Elevation: +68 * Thickness: >23
Geologic Description: PREDOMINANTLY GY & GY-WH FINE LABILE SANDSTONE WITH GY & GY-GN MUDSTONE & SILTSTONE INTERBEDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 33

REFERENCE # A14 Y1
REFERENCE # A14 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-6	21 06'00"S	145 40'51"E	+308	+309	-53	362	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - LONGTON AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1978/15
Page Publn Year: 1978
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF LOWER TRIAS Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:120 Base Elevation: +189 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:328 Base Elevation: -19 Thickness: 208
Geologic Description: 14% COAL. SPLITTING PRONOUNCED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV. UNCONFORMITY AT BASE

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOE JOE GP Age: EARLY PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -53 * Thickness: >34
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER TRIAS Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:120 Base Elevation: +189 Thickness: 119
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * DEPTH TO BASE UNCERTAIN AS BASE OCCURS IN OPEN-HOLED SECTION

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y102
Basal Information. Depth to Base:328 Base Elevation: -19 Thickness: 208
Geologic Description: LT GY-WH QZOSE (SOME SUBLAB) F-VC SST WITH MICAC & CARB PARTINGS, COAL SEAMS, & MINOR PBL BEDS, POLYMICTIC CGL, M-DK GY SLTST & MDST & TFAC MDST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: SM C	197	+112	20
COAL INTERVAL: SM D	222	+87	9
COAL INTERVAL: SM E	269	+40	5
COAL INTERVAL: SM F	290	+19	8

Tectonic Structure: DIP (5 DEGREES
Remarks THICKNESS APPROX AS DEPTH TO TOP UNCERTAIN. 1 M THICK COAL SEAM B OCCURS AT 144 M

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -53 * Thickness:)34
Geologic Description: LT GY F LAB SST, GY-GN F TFAC SST, & THINLY BDD MDSTS & SLTSTS INCLUDING VARVE-LIKE SEQ OF LT GY-GN SLTST & SILTY MDST, & DK GN MDST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GALILEE NS 5

REFERENCE # A20 Y1
REFERENCE # A20 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-10	22 48'30"S	146 25'00"E	+290*	+290*	-156*	446	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1

CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - BEGULLA AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1973/19

Page Publn Year: 1973

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZUIC Interpretation Code:X101
Basal Information: Depth to Base:106 Base Elevation: +184 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:212 Base Elevation: +78 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:338 Base Elevation: -48 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -156 * Thickness: >108
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:106 Base Elevation: +184 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:212 Base Elevation: +78 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:338 Base Elevation: -48 Thickness: 126
Geologic Description: LT-M GY GEN F-M OCCAS PBLY LAB (SOME SUBLAB-QZOSE) SSTS WITH FOSSIL WOOD FRAGS + MICAS ON CARB PARTINGS, LT-M GY + FAWN MDSTS, GY SLTSTS, COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SEAM A-B	229	-199	15 CA
COAL: SEAM C	288	-258	6.5 CA
COAL: SEAM D	301	-271	3.5 CA
COAL ETC: SEAM E	337	-307	4 CA

Tectonic Structure:
Remarks PALYNOLOGICAL AGE: IMMEDIATELY ABOVE LOWEST COAL SEAM - STAGE 5

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -456 * Thickness: >108
Geologic Description: VARVE-LIKE TFAC MDST + SLTST, F-M GY-GN SUBLAB-QZOSE (SOME LAB) SSTS WITH FOSSIL WOOD FRAGS, INTBDS VOLC PBL CGL, LT GY-DK GN MDSTS (SOME TFAC)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGICAL AGE: STAGE 3 AT 344 M. VARVES IN THIS SECTION DETERMINED AS STAGE 2

CONTROL POINT: GALILEE NS 8

REFERENCE # A19 BY
REFERENCE # A19 BX

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-10	22 25'07"S	146 28'03"E	+240#	+240#	-370#	610	#?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference:

REFERENCE: Y1 CARR, A.F.
GALILEE BASIN EXPLORATORY COAL DRILLING - LAGLAN AREA
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1974/12

Page Publn Year: 1974

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:122 Base Elevation: +118 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:226 Base Elevation: +14 Thickness: 104
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -370 # Thickness: >384
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PROBABLY PRE-ARAMAC CM JOE JOE GP

STRATIGRAPHY: UNDIFF TERTIARY Age: TERTIARY Interpretation Code:Y101
Basal Information: Depth to Base:122 * Base Elevation: +118 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * DEPTH TO BASE UNCERTAIN. SURFACE, REFERENCE AND BOTTOM ELEVATIONS QUOTED ABOVE ARE APPROXIMATE

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:226 Base Elevation: +14 Thickness: 184
Geologic Description: LT GY F & M SUBLAB-LAB SSTS, LT GY C-VC QZOSE SST, PETROMICT CGL, GY SLTST, LT-M GY MDSTS, COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL: SEAM C	150	+98	5 CA
COAL: SEAM D	159	+81	2.5 CA
COAL: SEAM E	175	+65	2 CA
COAL: SEAM F	195	+45	5 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:TD Base Elevation: -370 * Thickness:)384
Geologic Description: LT GY + GN F LAB-SUBLAB PARTLY TFAC SST WITH VOLC PBLS, INTBDD LT GY,GY-GN F-M LAB-SUBLAB MICAC TFAC SST, M-DK GY, GN-GY CARB MDST, WH TFAC MDST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GILMORE 1

REFERENCE # A&S Y1
REFERENCE # A&S X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Box El	T.Dpth	status code
PHILLIPS-SUNRAY	RCH, CORE + WIRELINE	SG/55-5	25 21'33"S	144 48'38"E	+322	+327	-4819	4346	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y1 LEWIS, J.H., AND KYRANIS, N.
PHILLIPS-SUNRAY GILMORE NO.1, AUTHORITY TO PROSPECT 84P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS PETROLEUM COMPANY UNPUBLISHED REPORT. BMR FILE 64/4039 Page Publn Year: 1965
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1767 Base Elevation: -1440 Thickness: 1762
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1963 Base Elevation: -1636 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: STAGE 1 TO 2 (AT 1771 & 1833 M) (NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1963 Base Elevation: -1636 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X104
Basal Information: Depth to Base:3213 Base Elevation: -2886 Thickness: 1250
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:3630 Base Elevation: -3303 Thickness: 417
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
SHALE/SILTSTONE MB	3374	-3874	161
SANDSTONE MEMBER	3630	-3383	256

Tectonic Structure:
Remarks

STRATIGRAPHY: COOLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:3643 Base Elevation: -3316 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LISSOY SST Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:3812 Base Elevation: -3485 Thickness: 169
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LOG CREEK FM Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -4019* Thickness: >534
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
UPPER UNIT	3997	-3670	185
LOWER UNIT	TD	-4019*	>349

Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:1120 Base Elevation: -793 Thickness: 1115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY-ADORI Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1431 Base Elevation: -1104 Thickness: 311
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HOORAY SST TO ADORI SST. CALLED BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1515 Base Elevation: -1188 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1768 Base Elevation: -1441 Thickness: 253
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1964 Base Elevation: -1637 Thickness: 196
Geologic Description: GY-BR SOFT-FIRM SH, WH-LT GN F-C CALCAREOUS TIGHT SST WITH ANGULAR-ROUNDED QZ GRS, INTBDD LT GY-BR SL CALC SLTST, GY-ER SH & MINOR F SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y106
Basal Information: Depth to Base:3214 Base Elevation: -2887 Thickness: 1250
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -4019% Thickness:)i132
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GLENARAS 1

REFERENCE # A27 Y1
REFERENCE # A27 Y2
REFERENCE # A27 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS AUST.	RDH, CORE + WIRELINE	SF/55-13	23 05'52"S	144 43'23"E	+235	+239	-1398	1637	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MCDONAGH, G.P.
PHILLIPS-SUNRAY GLENARAS NO.1, AUTHORITY TO PROSPECT 106P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL COMPANY UNPUBLISHED REPORT. BMR FILE 66/4221 Page Publn Year: 1966
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:850 Base Elevation: -611 Thickness: 845
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1006 Base Elevation: -767 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks B'DARY CRITERIA: TOP: GAMMA-RAY, SP SHIFT APPROX 25 M ABOVE TOP COAL; BASE - GAMMA-RAY SHIFT, CHANGE IN PALYNOLOGY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1080 Base Elevation: -841 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALTERNATIVE INTERPRETATION: BASE OF ARAMAC AT 1122 M (FROM WIRELINE LOGS)

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1629 Base Elevation: -1390 Thickness: 549
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF FM AT INITIAL FLATTENING OF SP CURVE

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1629 Base Elevation: -1390 Thickness: 623
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1398* Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:558 Base Elevation: -319 Thickness: 554
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ROMA + TAMBO FORMATIONS OF COMPLETION REPORT

STRATIGRAPHY: HOORAY-ADORI Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:700 Base Elevation: -461 Thickness: 142
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS UNDIFFERENTIATED HOORAY SST, WESTBOURNE FM AND ADORI SST (BLYTHESDALE FM OF COMPLETION REPORT)

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:767 Base Elevation: -528 Thickness: 67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:877 Base Elevation: -638 Thickness: 110
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-BLACK ALLEY Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:991 Base Elevation: -752 Thickness: 114
Geologic Description: INTBDD WH, VF-M, CARB, MICAC, V SL CALC IN PART, MOD SRTD, HARD, ANGULAR-SUBROUNDED QZ SST, BLACK BRIGHT COAL, & MINOR LT GY SHALE
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL	878	-639	1.5 CA
	COAL	898	-659	1 CA
	COAL INTERVAL: 4 SMS	940	-701	22 CA
	COAL INTERVAL: 3 SMS	981	-742	19 CA

Tectonic Structure:
Remarks: CONTAINS UNDIFF BANDANNA FM EQUIV & BLACK ALLEY SH EQUIV. DISCONFORMITIES AT TOP & BASE. UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: BLACK ALLEY SH EQUIV Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: * BLACK ALLEY SH EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-BLACK ALLEY" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1088 Base Elevation: -849 Thickness: 97
Geologic Description: SST AS IN BANDANNA-BLACK ALLEY WITH MINOR COAL SEAMS AND DARK GREY-BROWN, CARBONACEOUS, MICROMICACEOUS, FIRM SHALE
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL INTERVAL: 3 SMS	1006	-767	16 CA
	COAL INTERVAL: 4 SMS	1022	-783	7 CA
	COAL INTERVAL: 2 SMS	1065	-826	8 CA
	COAL	1078	-839	2 CA

Tectonic Structure:
Remarks: CALLED "REIDS DOME BEDS" EQUIVALENTS IN WELL COMPLETION REPORT. PALYNOSTRATIGRAPHY: STAGE 3 (NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1629 Base Elevation: -1390 Thickness: 541
Geologic Description: LT-M GY F-M ANG-SUBROUND MICAC ARG-V ARG PARLTY CALC POORLY SORTED PARTLY CGL SST - HARD SLTST, MINOR M-DK GY, RD-BR CARB CALC MICAC TRACE PY SH
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: PALYNOSTRATIGRAPHY: UPPER STAGE 2 - LOWER STAGE 2 (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1398* Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:850 Base Elevation: -611 Thickness: 846
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1006 Base Elevation: -767 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CK Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1080 Base Elevation: -841 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y206
Basal Information: Depth to Base:1545 Base Elevation: -1306 Thickness: 465
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1234 -995 93
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y207
Basal Information: Depth to Base:1629 Base Elevation: -1390 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1629 Base Elevation: -1390 Thickness: 623
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM, JOCHMUS FM & JERICHO FM

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -1398± Thickness:)8
Geologic Description: RHYOLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure.
Remarks

CONTROL POINT: GOLEBURRA 1

REFERENCE # A10 Y1
REFERENCE # A10 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HEMATITE PETROL.	RDH, CORE + WIRELINE	SF/54-12	22 25'01"S	142 36'35"E	+173	+178	-1403	1581	?

REFERENCE: X1 HAWKINS, P.J., AND GRAY, A.R.C.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLIGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981
Cross Reference:

REFERENCE: Y1 WATSON, P.J.
HEMATITE PETROLEUM PTY LTD, WELL COMPLETION REPORT, GOLEBURRA NO.1
HEMATITE PETROLEUM PTY LTD UNPUBLISHED REPORT. BMR FILE 72/2759 Page Publn Year: 1973
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1212 Base Elevation: -1034 Thickness: 1207
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1242 Base Elevation: -1064 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1295 Base Elevation: -1117 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARAMAC CM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1375 Base Elevation: -1197 Thickness: 80
Geologic Description: FIVE SIGNIFICANT COAL SEAMS, TOTAL OF NINE. AGGREGATE OF APPROX. 18 M OF COAL, I.E. APPROX. 22% OF FORMATION (THIS REPORT)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks B'CARY CRITERIA: TOP - FIRST MAJOR COAL, CHANGE IN LOGS; BOTTOM - LOWERMOST MAJOR COAL (THIS REPORT)

STRATIGRAPHY: UNDIFF UPPER CARB Age: CARBONIFEROUS Interpretation Code:X105
Basal Information: Depth to Base:1521 Base Elevation: -1343 Thickness: 146
Geologic Description: THREE COAL SEAMS, TOTAL OF APPROX. 3.3 M OF COAL (THIS REPORT)
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1403# Thickness: >60
Geologic Description: PHYLLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS % Interpretation Code:Y101
Basal Information: Depth to Base:826 Base Elevation: -648 Thickness: 821
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LONGSIGHT SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1022 Base Elevation: -844 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1056 Base Elevation: -878 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1242 Base Elevation: -1064 Thickness: 186
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1520 Base Elevation: -1342 Thickness: 278
Geologic Description: INTBDD BLACK LUSTROUS-DULL COALS, PDORLY SORTED, POORLY CONSOLIDATED, SLIGHTLY CALCAREOUS SSTS, SILTSTONE, SHALE. QUARTZITE AT TOP
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1309	-1131	12 CA
COAL/SST/SH INTERVAL	1349	-1171	27 CA
COAL/SST/SH INTERVAL	1372	-1194	20 CA
COAL	1419	-1241	1 CA

Tectonic Structure:

Remarks QZITE AT TOP OF UNIT HAS CHARACTER OF SILCRETE; POSS WEATHERING PROFILE. MICROFLORA: ST. 3 (1332-1419 M) ST. 2 (1515-18)

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -1403# Thickness:)61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GREY RANGE 1

REFERENCE # A63 Y1
REFERENCE # A63 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HARTOGEN EXPL.	RDH, WIRELINE	SG/55-5	25 06'33"S	144 37'22"E	+348	+352	-3139	3491	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
PORTER, C.R.
WELL COMPLETION REPORT, GREY RANGE NO.1, A TO P 183P, QUEENSLAND
HARTOGEN EXPLORATIONS PTY. LTD. UNPUBLISHED REPORT. BMR FILE 74/215
Page Publn Year: 1974
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:32 Base Elevation: +320 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:1942 Base Elevation: -1590 Thickness: 1910
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:2011 Base Elevation: -1659 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2105 Base Elevation: -1753 Thickness: 94
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2231 Base Elevation: -1879 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2231 Base Elevation: -1879 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X107
Basal Information: Depth to Base:3156 Base Elevation: -2804 Thickness: 925
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETOKVALE FM Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:3321 Base Elevation: -2969 Thickness: 165
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHALE/SILTSTONE MB 3248 -2896 92
SANDSTONE MEMBER 3321 -2969 73
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X109
Basal Information: Depth to Base:3360 Base Elevation: -3008 Thickness: 39
Geologic Description: RED BEDS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -3139* Thickness:)131
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:1279 Base Elevation: -927 Thickness: 1275
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1501 Base Elevation: -1149 Thickness: 222
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1564 Base Elevation: -1212 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1615 Base Elevation: -1263 Thickness: 51
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1718 Base Elevation: -1366 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1943 Base Elevation: -1591 Thickness: 225
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2233 Base Elevation: -1881 Thickness: 290
Geologic Description: GY-DK GY BR BRITTLE FISSILE CARB SH, WH-LT GY M-C WELL SRTD ANG-SUBRND SST, COAL SEAMS, INTBDD M-DK GY SH + GY-LT GN SLTST WITH MINOR F-M SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL, 2 SMS 2021 -1669 8
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y108
Basal Information: Depth to Base:3159 Base Elevation: -2807 Thickness: 926
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y109
Basal Information: Depth to Base:3315 Base Elevation: -2963 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:3360 Base Elevation: -3008 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: BASEMENT Age: EARLY DEVONIANInterpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -3139* Thickness: >131
Geologic Description: GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: GSQ JERICHO 1

REFERENCE # A37

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-14	23 38'00"S	146 22'00"E	+400CA	+400CA	-414	814	

REFERENCE: HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981
Cross Reference: SWARBRICK, C.F.J., 1974, QLD. GOVT. MIN. J. 75, 210-215

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:69 Base Elevation: +331 Thickness: 67
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:92 Base Elevation: +308 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:172 Base Elevation: +228 Thickness: 82
Geologic Description: INTBDD GY GY-GN VF-F, M-F MOD-WELL SRTD LAB SST, GY FINELY INTBDD + PARTLY LAMD SLTST + MDST (LEAF FRAGS), & COAL WITH SLTST + TFAC MDST BANDS
Reported Environment: LACUSTRINE & FLUVIATILE. PAUCITY OF COAL SEAMS SUGGESTS THAT SEDIMENTATION WAS LARGELY SUBAQUEOUS (SWARBRICK, 1974)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - SWARBRICK, 1974. COAL = 3.6% OF FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:192 Base Elevation: +208 Thickness: 20
Geologic Description: DK GY-BLK V FINELY CARB FINE BEDDED-LAMINATED MDST. THIN BEDS OF TFAC SST AND MDST THROUGHOUT PARTICULARLY IN UPPER PART (SWARBRICK, 1974)
Reported Environment: ENCLOSED BASIN WHICH SLOWLY FILLED WITH SEDIMENT TO BECOME A SHALLOW LAKE IN BANDANNA TIMES (SWARBRICK, 1974)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:216 Base Elevation: +184 Thickness: 24
Geologic Description: LOWER PART: LT GY SLTST, DK GY-BLK MDST + COAL. UPPER PART: WH LT GY BUFF M-F WELL SRTD SUBROUND QZOSE + SUBLAB SST (ABUNDANT CARB LEAF FRAGS)
Reported Environment: DELTAIC - PROBABLY CLOSER TO THE MOUTH THAN THAT OF THE UNDERLYING COLINLEA SST (SWARBRICK, 1974)
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks GEOLOGIC DESCRIPTION - SWARBRICK, 1974

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:274 Base Elevation: +126 Thickness: 58

Geologic Description: LT GY LT BR M-C MOD-POORLY SRTD SUBLAB-QZOSE MASS SST, VF-F WH-LT GY WELL SRTD SUBLAB-QZOSE F-THICK BDD SST M-DK GY F-BDD SLTST & MDST, COAL
Reported Environment: UPPER PART OF A DELTA - COARSE SST REPRESENTING LAG & FILL DEPOSITS, THE FINE SST & SLTST REPRESENTING BACKSWAMP DEPOSITS (SWARBRICK, 1974)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL: BRIGHT, BIT.	224	+178	1.63
	COAL: BRIGHT, BIT.	243	+159	5.69

Tectonic Structure:
Remarks: GEOLOGIC DESCRIPTION - SWARBRICK, 1974. COAL = 5.6% OF FM

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:580 Base Elevation: -180 Thickness: 386
Geologic Description: SEE JOE JOE GP ENTRY
Reported Environment: SEE JOE JOE GP ENTRY
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -414 * Thickness: >234
Geologic Description: SEE JOE JOE GP ENTRY
Reported Environment: SEE JOE JOE GP ENTRY
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	OAKLEIGH SLTST MB	TD	-414*	>8

Tectonic Structure:
Remarks:

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -414 * Thickness: >540
Geologic Description: MDST AT BASE, C-VC POORLY SRTD SST & PBL CGL, M GR MOD-WELL SRTD SST, VARVED SLTST & MDST. THIN BDD-LAMD MDST, SLTST, SST. SCATTERED PEBBLES
Reported Environment: PARTLY PERIGLACIAL & FLUVIOGLACIAL ENVIRONMENT OF DEPOSITION. CONTEMPORANEOUS VOLCANISM (SWARBRICK, 1974)
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: SOME MDST TUFFACEOUS. GEOLOGIC DESCRIPTION - SWARBRICK, 1974. CONTAINS JOCHMUS & JERICHO FORMATIONS

CONTROL POINT: HEXHAM 1

REFERENCE # A21 Y1
REFERENCE # A21 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
QLD DEPT MINES	DDH, CORE + WIRELINE	SF/55-10	22 48'22"S	145 57'08"E	+366	+370	-1460	1830	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
SWARBRICK, C.F.J., AND WALLIN, C.I.
WELL COMPLETION REPORT - QDM ARAMAC 1 AND HEXHAM 1
GEOLOGICAL SURVEY OF QUEENSLAND REPORT NO. 92
Page Publn Year: 1976
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:X101
Basal Information: Depth to Base:216 Base Elevation: +154 Thickness: 212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:309 Base Elevation: +61 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:614 Base Elevation: -244 Thickness: 305
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:715 Base Elevation: -345 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:793 Base Elevation: -423 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1323 Base Elevation: -953 Thickness: 538
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1460± Thickness: >507
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -1460± Thickness: >1037
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS FM & JERICHO FM

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y101
Basal Information: Depth to Base:216 Base Elevation: +154 Thickness: 212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:309 Base Elevation: +61 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:614 Base Elevation: -244 Thickness: 305
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:715 Base Elevation: -345 Thickness: 101

Geologic Description: LT GY-LT GN GY VF-C PDORLY SRTD LAB-SUBLAB SST, M-DK GY CARB MICAC SLTST, M-DK GY + BR FISSILE CARB MICAC SH, BLK-GY BLK BRITTLE BRIGHT COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SPORE ASSEMBLAGES - UPPER STAGE 5 (LATE PERMIAN)

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:793 Base Elevation: -423 Thickness: 78
Geologic Description: LT GY M-VC + PBLY FAIRLY-PDORLY SRTD SUBLAB-QZOSE SSTS WITH ARG + PARTLY CALC MATRIX, BLK-GY BLK BRITTLE MAINLY DULL + DIRTY COAL, + CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks SPORE ASSEMBLAGES - UPPER STAGE 5 (LATE PERMIAN)

STRATIGRAPHY: JOCHMUS FM Age: CARB-PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1323 Base Elevation: -953 Thickness: 530
Geologic Description: UPPER PART: F-C MOD-WELL SRTD SST, MDST, SLTST & TUFF. EDIE TF: MDST, SLTST, TUFF, VF-F SST. LOWER PART: VF-C MOD-PDORLY SRTD SST, SLTST, MDST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1004 -634 171
Tectonic Structure:
Remarks SPORE ASSEMBLAGES - STAGES 2 AND 3. UNIT IS VARIABLY TUFFACEOUS, MICACEOUS, CARBONACEOUS

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -1460* Thickness: >507
Geologic Description: LT-DK GY BR GN MICROMICAC LOCALLY SANDY IFAC CARB SLTST, GY GN FISSILE LOCALLY SILTY MICAC MDST, MINOR BUFF-LT GY VF-M QZOSE-SUBLAB SST, + TUFF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
OAKLEIGH SLTST MB 1680 -1310 132
>30% TUFF 1372 -1002 34
Tectonic Structure:
Remarks SPORE ASSEMBLAGES - STAGE 2

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1460* Thickness: >1037
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS + JERICHO FORMATIONS

CONTROL POINT: HUGHENDEN 3-4R

REFERENCE # A2

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-1	20 38'00"S	145 23'00"E	+444	+445	-122	567	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC DRILLING IN THE HUGHENDEN 1:250,000 SHEET AREA, 1974-75
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 78 Page 382-392 Publn Year: 1977
Cross Reference: MCKELLAR, J.L., 1977, QLD. GOVT. MIN. JOURNAL VOL.78, 393-399

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:50 Base Elevation: +395 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: BETTS CREEK BEDS Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:158 Base Elevation: +287 Thickness: 108
Geologic Description: WH-LT GY F-VC + PBLY POORLY SRTD SUBLAB-QZOSE PARTLY MICAC SST (ARG MATRIX), LT-DK GY CARB SLTST + SH, INTBDD COAL + CARB SH, QZ PBL CGL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	82	+363	19
COAL INTERVAL	145	+300	40
CGL INTERVAL	123	+322	34

Tectonic Structure:
Remarks PALYNOLOGICAL ASSEMBLAGE - UPPER STAGE 5 (MCKELLAR, 1977)

STRATIGRAPHY: BOONDERDOO BEDS Age: CARB-PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:415 Base Elevation: +30 Thickness: 257
Geologic Description: LT GY-WH F-M FAIRLY-WELL SRTD LAB + SUBLAB PARTLY MICAC MASS SST, LT GY-LT GN GY M-DK GY MICAC TFAC SLTST + SH WITH CARB FRAGS, COAL, TUFF, CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGICAL ASSEMBLAGE - STAGE 2 (PROBABLY LOWER STAGE 2) (MCKELLAR, 1977)

STRATIGRAPHY: DUCABROOK FM Age: CARBONIFEROUS Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -122 # Thickness:)152
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: HUGHENDEN 6

REFERENCE # A3

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORED	SF/55-1	20 21'00"S	144 27'00"E	+639	+640	+112	528	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC DRILLING IN THE HUGHENDEN 1:250,000 SHEET AREA, 1974-75
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 78 Page 382-392 Publn Year: 1977
Cross Reference: MCKELLAR, J.L., 1977, QLD. GOVT. MIN. JOURNAL VOL.78, 393-399

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: BASALT Age: ? Interpretation Code:Yi01
Basal Information: Depth to Base:5 Base Elevation: +635 Thickness: 4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: BLANTYRE SST Age: JURASSIC Interpretation Code:Yi02
Basal Information: Depth to Base:51 * Base Elevation: +589 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks *FORMATION BASE OCCURS WITHIN AN INTERVAL OF OPEN HOLING FROM 47-54 M; THEREFORE THICKNESS IS APPROXIMATE

STRATIGRAPHY: WARANG SST Age: TRIASSIC Interpretation Code:Yi03
Basal Information: Depth to Base:202 Base Elevation: +436 Thickness: 151
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks THICKNESS IS APPROXIMATE AS FORMATION TOP NOT DEFINITELY KNOWN

STRATIGRAPHY: BETTS CREEK BEDS Age: PERMIAN Interpretation Code:Yi04
Basal Information: Depth to Base:311 Base Elevation: +329 Thickness: 109
Geologic Description: PARTLY CGL SST, INTBDD SLTST, SH + MINOR TUFF, CGL, AND COAL + CARB SHALE. COARSER WITH MORE INTBDD SST THAN IN HUGHENDEN 3-4R
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	226 CA	+414	3 CA
COAL INTERVAL	275 CA	+365	2.5 CA

Tectonic Structure:
Remarks

STRATIGRAPHY: BOONDEROO BEDS Age: CARB-PERMIAN Interpretation Code:Yi05
Basal Information: Depth to Base:TD Base Elevation: +112 * Thickness: >217
Geologic Description: SIMILAR TO 3-4R. SST COARSER, MORE QZ-RICH + MORE CGL. PBLS OF VOLC, ACID IGNEOUS + METAMORPHIC ORIGIN RATHER THAN SED (AS IN 3-4R). NO COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGICAL ASSEMBLAGE - STAGE 2 (PROBABLY UPPER STAGE 2) (MCKELLAR, 1977)

CONTROL POINT: HUGHENDEN 7

REFERENCE # A5

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SF/55-1	20 57'00"S	144 11'00"E	+330	+331	-564	895	

REFERENCE: BALFE, P.E.
STRATIGRAPHIC DRILLING REPORT - GSQ HUGHENDEN 7
QUEENSLAND GOVERNMENT MINING JOURNAL VOLUME 80 Page 282-293 Publn Year: 1979
Cross Reference: MCKELLAR, J.L., 1979, QLD. GOVT. MIN. JOURNAL VOL. 80, 295-302

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: TODLEBUC FM Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:21 Base Elevation: +310 Thickness: 20
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:177 Base Elevation: +154 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GILBERT RIVER FM Age: CRETACEOUS Interpretation Code:Y103
Basal Information: Depth to Base:193 Base Elevation: +138 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y104
Basal Information: Depth to Base:211 Base Elevation: +120 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:244 Base Elevation: +87 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:386 Base Elevation: -55 Thickness: 142

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:536 Base Elevation: -205 Thickness: 150
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WARANG SST Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:876 Base Elevation: -545 Thickness: 340
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BETTS CREEK BEDS Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:TD Base Elevation: -564 # Thickness: >19
Geologic Description: DULL COAL (BRIGHT BANDS), LT BR,GR,LT GY,WH FINING UP C-VF FAIRLY-WELL SRTD SUBLAB-LAB SST (ARG MATRIX, CARB MICAC PRTG), BR-YL+BLK CARB SLTST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	886	-555	9.8
COAL INTERVAL: 2 SMS	TD	-564	9

Tectonic Structure:
Remarks SLTST - COAL LAM + MICA. SST - TUFF FRAGMENTS. 2 COAL SEAMS ARE 1.4 + 0.3 M THICK. PALYNOLOGY - UPPER STAGE 5 (MCKELLAR)

CONTROL POINT: HULTON 1

REFERENCE # A31 Y1
REFERENCE # A31 Y2
REFERENCE # A31 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
LONGREACH OIL	RDH, CORE + WIRELINE	SF/55-13	23 23'25"S	144 55'20"E	+231	+235	-426	661	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference: EVANS, P.R., 1964, BUR. MIN. RES. RECORD 1964/197 // NORVICK, M., 1974, BUR. MI N. RES. RECORD 1974/141

REFERENCE: Y1
MOTT, W.D., AND ASSOCIATES
WELL COMPLETION REPORT, HULTON NO.1
LONGREACH OIL LIMITED UNPUBLISHED REPORT. BMR FILE 64/4059
Page Publn Year: 1964
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:X101
Basal Information: Depth to Base:283 Base Elevation: -48 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:356 Base Elevation: -121 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:X103
Basal Information: Depth to Base:382 Base Elevation: -147 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:X104
Basal Information: Depth to Base:396 Base Elevation: -161 Thickness: 14
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:459 Base Elevation: -224 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:558 Base Elevation: -323 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:626 Base Elevation: -391 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOLOGY: ?PERMIAN AT 607, 622 M (EVANS, 1964). CAVING - EXTENSIVE CONTAM., NO STAGE ID. POSSIBLE (NORVICK, 1974)

STRATIGRAPHY: DRUMMOND BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -426 # Thickness:)35
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:283 Base Elevation: -48 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOOKAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:358 Base Elevation: -123 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED TRANSITION BEDS + HOOGA SST IN W.C.R.

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:375 Base Elevation: -140 Thickness: 17
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED FOSSIL WOOD BEDS IN W.C.R.

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Yi04
Basal Information: Depth to Base:391 Base Elevation: -156 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED GUBBERAMUNDA SST IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Yi05
Basal Information: Depth to Base:457 Base Elevation: -222 Thickness: 66
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Yi06
Basal Information: Depth to Base:558 Base Elevation: -323 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY-COLINLEA Age: PERMIAN Interpretation Code:Yi07
Basal Information: Depth to Base:627 Base Elevation: -392 Thickness: 69
Geologic Description: M-DK GY & BR MICAC PY SL CALC SHALE WITH LESSER LT TAN SL CALC PY SLTST, & LT GY-WH F-C FRIABLE ARG SST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED PEAWADDY FM (MANTUAN FM IN W.C.R.) & COLINLEA SST EQUIV

STRATIGRAPHY: PEAWADDY FM EQUIV Age: PERMIAN Interpretation Code:Yi08
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * PEAWADDY FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "PEAWADDY-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Yi09
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "PEAWADDY-COLINLEA" ENTRY

STRATIGRAPHY: DRUMMOND BASIN SEQ. Age: DEVONIAN-CARB Interpretation Code:Yi10

Basal Information: Depth to Base:TD Base Elevation: -426 ± Thickness:)34
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:558 Base Elevation: -323 Thickness: 554
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:627 Base Elevation: -392 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: DEVONIAN-CARB Interpretation Code:Y203
Basal Information: Depth to Base:TD Base Elevation: -426 ± Thickness:)34
Geologic Description: QUARTZITE & TUFF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ISIS DOWNS 1

REFERENCE # A69

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ESSO AUSTRALIA	RDH, CORE + WIRELINE	SG/55-1	24 16'52"S	144 35'29"E	+213	+220	-1539	1759	

REFERENCE: ESSO AUSTRALIA LTD
ISIS DOWNS NO. 1 WELL COMPLETION REPORT (CONFIDENTIAL) (UNPUBLISHED)

Page Publn Year: 1981

Cross Reference:

SEDIMENTARY BASIN: CALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1346 Base Elevation: -1126 Thickness: 1339
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1362 Base Elevation: -1142 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1747 Base Elevation: -1527 Thickness: 385
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -1539# Thickness:)12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: KOBURRA 1

REFERENCE # A13 Y1
REFERENCE # A13 Y2
REFERENCE # A13 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
FLINDERS PETROL.	RDH, CORE + WIRELINE	SF/55-5	21 17'48"S	145 18'06"E	+370	+375	-2884	3259	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
PEMBERTON, R.L., AND LE GAY BRERETON, J.
WELL COMPLETION REPORT, KOBURRA NO.1, QUEENSLAND
FLINDERS PETROLEUM N.L. UNPUBLISHED REPORT. BMR FILE 70/453
Page Publn Year: 1970
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:6 Base Elevation: +369 Thickness: 1
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:101 Base Elevation: +274 Thickness: 95
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:1331 Base Elevation: -956 Thickness: 1230
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1445 Base Elevation: -1070 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. TOP PICKED AT CHANGE IN MICROFLORA (U. STAGE 5 - TRIASSIC), CHANGE IN LOGS, BASE AT CHANGE IN LOGS

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:2967 Base Elevation: -2592 Thickness: 1522
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DRUMMOND BASIN SEQ. Age: PRE-LATE CARB Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -2884* Thickness: >292
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: RONLOW BEDS Age: JURASSIC-CRET Interpretation Code:Y101
Basal Information: Depth to Base:149 Base Elevation: +226 Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y102
Basal Information: Depth to Base:818 Base Elevation: -443 Thickness: 669
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1104 Base Elevation: -729 Thickness: 286
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1330 Base Elevation: -955 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1445 Base Elevation: -1070 Thickness: 115
Geologic Description: INTBDD F-C FAIRLY SRTD VARIABLY MICAC, CARB, CALC SST, VARICOLOURED CARB, COALY SHALES + SLTSTS, + BLK VITREOUS COAL IN SEAMS UP TO 6 M THICK
Reported Environment:
Interpreted Environment:

Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: 2 SMS	1344	-969	11 CA
COAL INTERVAL: 3 SMS	1412	-1037	19 CA
COAL INTERVAL: 2 SMS	1445	-1070	6 CA

Tectonic Structure:
Remarks: UNCONFORMITY AT BASE. PALYNOLOGICAL ASSEMBLAGE - UPPER STAGE 5

STRATIGRAPHY: UNDIFF U.CARB-L.PERM Age: L.CARB-E.PERM Interpretation Code:Y106
Basal Information: Depth to Base:2967 Base Elevation: -2592 Thickness: 1522
Geologic Description: GY-BR-RD F-VC ARK LOCALLY TFAC SST, GY F-C + PBLY MICAC ARG SST, DK GY-BR-GN VAR ARG SANDY CARB TFAC SLTST, LT-M GY SL CARB SH, SILTY CLST.
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL: 2 SMS	1480	-1105	4 CA
COAL INTERVAL: 2 SMS	1492	-1117	5 CA

Tectonic Structure:
Remarks: ALSO, LT GY F-C + PBLY PARTLY TFAC? SST, GY F-C ARG SILTY GWKE, BLK VITREOUS COAL. PALYNOLOGICAL ASSEMBLAGE - STAGE 2

STRATIGRAPHY: UNDIFF PRE-UP. CARB Age: PRE-LATE CARB Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -2884* Thickness:)292
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:149 Base Elevation: +226 Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:818 Base Elevation: -443 Thickness: 669
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y203
Basal Information: Depth to Base:881 Base Elevation: -506 Thickness: 63
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DUNDA BEDS Age: TRIASSIC Interpretation Code:Y204
Basal Information: Depth to Base:1104 Base Elevation: -729 Thickness: 223
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y205
Basal Information: Depth to Base:1330 Base Elevation: -955 Thickness: 226
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1446 Base Elevation: -1071 Thickness: 116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV + COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks # COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y209
Basal Information: Depth to Base:1930 Base Elevation: -1555 Thickness: 484
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1588 -1215 111
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y210
Basal Information: Depth to Base:2734 Base Elevation: -2359 Thickness: 804
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
OAKLEIGH SLTST MB 2311 -1936 135
Tectonic Structure:
Remarks

STRATIGRAPHY: LAKE GALILEE SST Age: CARBONIFEROUS Interpretation Code:Y211

Basal Information: Depth to Base:2967 Base Elevation: -2592 Thickness: 233
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARBONIFEROUS Interpretation Code:Y212
Basal Information: Depth to Base:2967 Base Elevation: -2592 Thickness: 1521
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS & JERICHO FMS & LAKE GALILEE SST

STRATIGRAPHY: PRE-GALILEE SEQUENCE Age: PRE-LATE CARB Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -2884 Thickness: 1292
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LAKE GALILEE 1

REFERENCE # A1B Y1
REFERENCE # A1B Y2
REFERENCE # A1B X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
EXOIL-TRANSOIL	RDH, CORE + WIRELINE	SF/55-10	22 11'33"S	145 58'32"E	+289	+294	-3112	3406	?

REFERENCE: X1 THIS REPORT Page Publn Year:

Cross Reference:

REFERENCE: Y1 PEMBERTON, R.L.
WELL COMPLETION REPORT, LAKE GALILEE NO. 1.
EXOIL N.L. + TRANSOIL N.L., UNPUBLISHED REPORT. BMR FILE NO. 64/4076 Page Publn Year: 1964

Cross Reference:

REFERENCE: Y2 HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981

Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:53 Base Elevation: +241 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:862 Base Elevation: -568 Thickness: 809
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1060 Base Elevation: -766 Thickness: 198
Geologic Description: COAL: DK BR EARTHY TO BLACK VITREOUS BLOCKY. 26 SEAMS COMPRISING UP TO APPROX. 30% OF SECTION, WITH THICKNESSES UP TO 5 M EVIDENT FROM LOGS
Reported Environment:
Interpreted Environment: FINING-UPWARDS SEQUENCES INDICATED BY LOGS
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE. TOP PICKED AT TOP COAL, MARKED CHANGE IN R, BASE AT MARKED CHANGE IN SP & CHANGES IN R & GAMMA RAY

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:2841 Base Elevation: -2547 Thickness: 1781
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DRUMMOND BASIN SEQ. Age: PRE-LATE CARB Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -3112# Thickness. >565
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:53 Base Elevation: +241 Thickness: 49
Geologic Description: SURFACE CLAY
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM EQUIV Age: TRIASSIC Interpretation Code:Y1^2
Basal Information: Depth to Base:335 Base Elevation: -41 Thickness: 282
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP EQUIV Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:539 Base Elevation: -245 Thickness: 204
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP EQUIV Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:862 Base Elevation: -568 Thickness: 323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1059 Base Elevation: -765 Thickness: 197
Geologic Description: INTBDD DK BR-BLK VIT BLOCKY COAL, WH-LT GY F-GRANULAR WELL SRTD ARGILL MICAC CARB LI SST, + GN LT-DK GY + BLK CARB SANDY SILTY MICAC SH.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 867 -573 5
COAL T'OUT
Tectonic Structure:
Remarks SHALE CONTAINS WELL-PRESERVED PLANT REMAINS

STRATIGRAPHY: UNDIFF U.CARB-L.PERM Age: L.CARB-E.PERM Interpretation Code:Y106
Basal Information: Depth to Base:2841 Base Elevation: -2547 Thickness: 1782
Geologic Description: LT GY-GN F WELL SRTD ARG SILTY CALC ARK SL CARB SSTS, LT-M GY VF-M SIL WELL SRTD SST, BR GY GN ARG SANDY CARB SLTST, LT GY-BR ARG CALC SLTST-LST

Reported Environment:
Interpreted Environment:
Geologic Features. Feature Depth Elevation Thickness
MINOR COAL SMS T'OUT 4231 -3937 1390
Tectonic Structure:
Remarks ALSO CONTAINS GN BR + LT-V DK SANDY ARG CARB SH, DK GY GWKE, + PLT FOSSILS. PEBBLY IN PARTS. MINOR COAL T'OUT TOP 1396 M

STRATIGRAPHY: UNDIFF DEVONIAN Age: DEVONIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -3112% Thickness: >565
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y20%
Basal Information: Depth to Base:53 Base Elevation: +241 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:354 Base Elevation: -60 Thickness: 301
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y203
Basal Information: Depth to Base:460 Base Elevation: -166 Thickness: 106
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DUNDA BEDS Age: TRIASSIC Interpretation Code:Y204
Basal Information: Depth to Base:539 Base Elevation: -245 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y205
Basal Information: Depth to Base:862 Base Elevation: -568 Thickness: 323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1068 Base Elevation: -766 Thickness: 198
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV + COLINLEA SST EQUIV. PALYNOSTRATIGRAPHY: STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y209
Basal Information: Depth to Base:1815 Base Elevation: -1521 Thickness: 755
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1478 -1184 132
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 2 (AT 1063 & 1167 M) (NORVICK, 1974)

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y210
Basal Information: Depth to Base:2578 Base Elevation: -2264 Thickness: 763
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: ?LOWER STAGE 2 - STAGE 1 (NORVICK, 1974)

STRATIGRAPHY: LAKE GALILEE SST Age: CARBONIFEROUS Interpretation Code:Y211
Basal Information: Depth to Base:2841 Base Elevation: -2547 Thickness: 263
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: ?STAGE 1 (AT 2636 M) (NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: CARBONIFEROUS Interpretation Code:Y212
Basal Information: Depth to Base:2841 Base Elevation: -2547 Thickness: 1781
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS & JERICHO FMS & LAKE CALILEE SST

STRATIGRAPHY: BASEMENT Age: DEVONIAN Interpretation Code:Y213
Basal Information: Depth to Base:TD Base Elevation: -3112# Thickness:)565
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LEOPARDWOOD 1

REFERENCE # A67 Y1
REFERENCE # A67 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	SG/55-5	25 37'10"S	144 40'13"E	+287	+291	-3893	4184	?

REFERENCE: X1

THIS REPORT

Page Publn Year:

Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y1

MCDONAGH, G.P., KNUTH, B.W., AND PATTERSON, W.A.
PHILLIPS-SUNRAY LEOPARDWOOD NO. 1, AUTHORITY TO PROSPECT 109P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL CO. UNPUBLISHED REPORT. BMR FILE 65/4181 Page Publn Year: 1966

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1674 Base Elevation: -1383 Thickness: 1670
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:1681 Base Elevation: -1390 Thickness: 7
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: PROBABLY UPPER STAGE 5 (AT 1680 M) (NORVICK, 1974)

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X103
Basal Information: Depth to Base:3411 Base Elevation: -3120 Thickness: 1730
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X104
Basal Information: Depth to Base:4165 Base Elevation: -3874 Thickness: 754
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
SHALE/SILTSTONE MB	3816	-3525	405
SANDSTONE MEMBER	4165	-3874	349

Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -3893# Thickness: >19
Geologic Description: RED BEDS

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:1052 Base Elevation: -761 Thickness: 1048
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY-ADORI Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:1362 Base Elevation: -1071 Thickness: 310
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HOORAY SST TO ADORI SST. CALLED BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1435 Base Elevation: -1144 Thickness: 73
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1675 Base Elevation: -1384 Thickness: 240
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1680 Base Elevation: -1389 Thickness: 5
Geologic Description: DARK GREY TO BLACK CARBONACEOUS SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y106
Basal Information: Depth to Base:3423 Base Elevation: -3132 Thickness: 1743
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE Fm Age: DEVONIAN Interpretation Code:Y107
Basal Information: Depth to Base:4165 Base Elevation: -3874 Thickness: 742
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -3893# Thickness: >19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: LOVELLE DOWNS 1

REFERENCE # A9 Y1
REFERENCE # A9 Y2
REFERENCE # A9 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HEMATITE PETROL.	RDH, CORE + WIRELINE	SF/54-12	22 12'38"S	142 32'86"E	+179	+184	-1844	2028	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
WATSON, P.J.
LOVELLE DOWNS NO. 1 WELL COMPLETION REPORT
HEMATITE PETROLEUM PTY. LTD. UNPUBLISHED REPORT. BMR FILE 72/2669
Page Publn Year: 1973
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1381 Base Elevation: -1197 Thickness: 1376
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1486 Base Elevation: -1302 Thickness: 105
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1601 Base Elevation: -1417 Thickness: 115
Geologic Description: 10 COAL SEAMS, TOTAL THICKNESS 21 M; 16.3% COAL
Reported Environment:
Interpreted Environment:GAMMA LOG SHOWS FINING-UP SEQUENCES
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1872 Base Elevation: -1688 Thickness: 271
Geologic Description: TOTAL THICKNESS OF COAL (FROM SONIC LOG) IS 58.2 M; 21.5% COAL. 31 COAL SEAMS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:2007 Base Elevation: -1823 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:2007 Base Elevation: -1823 Thickness: 406
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X108
Basal Information: Depth to Base:TD Base Elevation: -1844# Thickness:)21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:1024 Base Elevation: -840 Thickness: 1019
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1207 Base Elevation: -1023 Thickness: 183
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED LONGSIGHT SST IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1257 Base Elevation: -1073 Thickness: 50
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1381 Base Elevation: -1197 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1486 Base Elevation: -1302 Thickness: 105
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1601 Base Elevation: -1417 Thickness: 115
Geologic Description: BLK COAL WITH INTBDD GY & MULTICOL SH, VF-M SST WITH SIL CEMENT, BR-GY & MULTICOL CARB SLTST. LOWER PART: M-C SUBRND-SUBANG QZ SST (ARG MATRIX)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1490	-1316	3 CA
COAL	1503	-1319	7 CA
COAL INTERVAL	1558	-1374	113 CA

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:2007 Base Elevation: -1823 Thickness: 406
Geologic Description: UPPER PART: BLK COAL WITH INTBDD M-C SST, GY & MULTICOL PARTLY CALC SHALE, DK GY-BLK VERY CARB SLTST. LOWER PART: M-C ANGULAR QZ SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1872	-1688	270 CA

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: STAGE 3. BELOW 1832 M, NO IDENTIFIABLE FORMS. THIN COAL SEAMS T'OUT COAL INTERVAL

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1844* Thickness:)21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:1381 Base Elevation: -1197 Thickness: 1376
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1486 Base Elevation: -1302 Thickness: 105
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1600 Base Elevation: -1416 Thickness: 114
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV + COLINLEA SST EQUIV.

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks *BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM EQUIV Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1872 Base Elevation: -1698 Thickness: 272
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER CARB Age: LATE CARB Interpretation Code:Y207
Basal Information: Depth to Base:2007 Base Elevation: -1823 Thickness: 135
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:2007 Base Elevation: -1823 Thickness: 407
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM AND UNDFF UPPER CARB.

STRATIGRAPHY: QUARTZITE Age: ? Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -1844* Thickness: 221
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MARANDA 1

REFERENCE # A32 Y1
REFERENCE # A32 Y2
REFERENCE # A32 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
OIL DEVELOPMENT	RDH, CORE + WIRELINE	SF/55-13	23 12'14"S	145 26'40"E	+259	+263	-1715	1978	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
LE BLANC, M.C.
OIL DEVELOPMENT N.L. MARANDA NO.1 WELL, QUEENSLAND, FINAL WELL REPORT
OIL DEVELOPMENT N.L. UNPUBLISHED REPORT BMR FILE NO. 62/1119
Page Publn Year: 1962
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:15 Base Elevation: +248 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:262 Base Elevation: +1 Thickness: 247
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:730 Base Elevation: -467 Thickness: 468
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:837 Base Elevation: -574 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:884 Base Elevation: -621 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks HIGHER SP & R THAN OVERLYING BANDANNA FM EQUIV

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:967 Base Elevation: -704 Thickness: 83
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP PICKED AT UPPER COAL SEAM, BASE AT DISTINCT CHANGE IN LOGS

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1970 Base Elevation: -1707 Thickness: 1003
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1970 Base Elevation: -1707 Thickness: 1086
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -1715 Thickness: 18
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:12 Base Elevation: +251 Thickness: 8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:55 Base Elevation: +208 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED ROMA FM IN WELL REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:61 Base Elevation: +182 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF BLYTHESDALE GP OF WELL REPORT

STRATIGRAPHY: INJUNE CREEK GP Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:109 Base Elevation: +154 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF BLYTHESDALE GP OF WELL REPORT

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:262 Base Elevation: +1 Thickness: 153
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BUNDAMBA GP IN WELL REPORT

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:417 Base Elevation: -154 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:538 Base Elevation: -275 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:730 Base Elevation: -467 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:807 Base Elevation: -544 Thickness: 77

Geologic Description: BUFF-LT GY SOFT MDST, GY SL MICAC + SILTY CARB SUB-FISSILE SH, GY ARG CARB SLTST, THIN BEDS F-M QZ SST, + SEVERAL COAL SEAMS
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL	736	-473	5 CA
	COAL	756	-493	3 CA
	COAL	764	-501	4 CA
	COAL	806	-543	5 CA

Tectonic Structure:
Remarks 2 M COAL SEAM AT -479 M (742 M DEPTH) + 1 M COAL SEAM AT -508 M (771 M DEPTH)

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1772 Base Elevation: -1509 Thickness: 965
Geologic Description: LT-M GY F-M SL LI QZ SST + PBLY SST, LT GY VF + F-M MOD SRTD SL SIL QZ SST, PBL CGL, LT-M GY SANDY ARG PARTLY CARB SLTST, DK GY CARB-COALY SLTST
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL	835	-572	3 CA
	COAL	867	-604	1 CA
	COAL	885	-622	1.5 CA
	COAL	910	-647	2 CA

Tectonic Structure:
Remarks ALSO CONTAINS LT-M GY + GN GY SL CARB SILTY SANDY SH. RARE PLANT FRAGMENTS. ?DISCONFORMITY AT BASE

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1970 Base Elevation: -1707 Thickness: 198
Geologic Description: LT-DK GY SL MICAC + SIL SHS + INTBDD MDST WITH QZ + QZITE FRAGS, LT GY VF-F + F-M QZ SST, POORLY SORTED LITHIC CGL, + LT GY SANDY SLTSTS
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks ANGULAR UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF LOWER PALAEOZ Age: PALAEOZOIC Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1715* Thickness:)8
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y201
Basal Information: Depth to Base:15 Base Elevation: +248 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y202
Basal Information: Depth to Base:262 Base Elevation: +1 Thickness: 247
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y203
Basal Information: Depth to Base:417 Base Elevation: -154 Thickness: 155
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y204
Basal Information: Depth to Base:538 Base Elevation: -275 Thickness: 121
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y205
Basal Information: Depth to Base:730 Base Elevation: -467 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:837 Base Elevation: -574 Thickness: 107
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:884 Base Elevation: -621 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5. UNCONFORMITY AT BASE (NORVICK, 1974)

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:910 Base Elevation: -647 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: PROBABLY STAGE 3 (NORVICK, 1974)

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y209
Basal Information: Depth to Base:1402 Base Elevation: -1139 Thickness: 492
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

EDIE TUFF MEMBER 1119 -856 153

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: STAGE 3 - UPPER STAGE 2 (NORVICK, 1974)

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y210
Basal Information: Depth to Base:1971 Base Elevation: -1708 Thickness: 569
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
OAKLEIGH SLTST MB	1888	-1625	103

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: PROBABLY STAGE 2 - STAGE 1, & ?STAGE 1 (NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1971 Base Elevation: -1708 Thickness: 1087
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM, JOCHMUS FM + JERICHO FM

STRATIGRAPHY: BASEMENT Age: PROT-E.PAL Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -1715* Thickness: ?7
Geologic Description: RECRYSTALLISED SHEARED SILTY MUDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: MARCHMONT 1

REFERENCE # A29 Y1
REFERENCE # A29 Y2
REFERENCE # A29 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
LONGREACH OIL	RDH, CORE + WIRELINE	SF/55-13	23 10'15"S	144 44'21"E	+226	+238	-1760	1990	?

REFERENCE: X1 THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 MOTT, W.D., AND ASSOCIATES
MARCHMONT NO. 1 WELL COMPLETION REPORT, DRUMMOND BASIN, A.T.P. 87P, QUEENSLAND
LONGREACH OIL LIMITED UNPUBLISHED REPORT. BMR FILE 64/4062
Page Publn Year: 1964
Cross Reference:

REFERENCE: Y2 HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:X101
Basal Information: Depth to Base:867 Base Elevation: -637 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ERO.ANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:960 Base Elevation: -730 Thickness: 956
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDES WALLOON COAL MEASURES

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1132 Base Elevation: -902 Thickness: 172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITY AT BASE B'DARY CRITERIA: TOP - SP, GAMMA-RAY SHIFT; BASE - GAMMA-RAY INCREASE

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1232 Base Elevation: -1002 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks BASE PICKED AT RESISTIVITY SHIFT

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -1760# Thickness:)758
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1760# Thickness:)758
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM AND UNDIFF JOE JOE GROUP

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Yi01
Basal Information: Depth to Base:639 Base Elevation: -409 Thickness: 635
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO TAMBO AND ROMA FORMATIONS OF WELL COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:750 Base Elevation: -520 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO TRANSITIONS BEDS + HOOGA SST OF BLYTHESDALE GP IN COMPLETION REPORT

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:782 Base Elevation: -552 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO FOSSIL WOOD BEDS OF BLYTHESDALE GP IN COMPLETION REPORT

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:795 Base Elevation: -565 Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks EQUIVALENT TO GUBBERAMUNDA SST OF BLYTHESDALE GP IN COMPLETION REPORT

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:867 Base Elevation: -637 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1007 Base Elevation: -777 Thickness: 140
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1271 Base Elevation: -1041 Thickness: 264
Geologic Description: M-DK GY SILTY PY MICAC CARB SL CALC SHALE WITH LT GY M-C SL CALC SST INTERBEDS, TFAC SH, + HARD BLACK COAL
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	COAL INTERVAL	1031	-801	22
	COAL INTERVAL	1075	-845	24
	COAL INTERVAL	1135	-905	9
	COAL INTERVAL	1159	-929	11

Tectonic Structure:
Remarks ALSO 6 M COAL INTERVAL AT 1107 M, 2 M COAL SEAM AT 1209 M AND 1 M COAL SEAM AT 1249 M

STRATIGRAPHY: PEAWADDY FM EQUIV Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1313 Base Elevation: -1083 Thickness: 42
Geologic Description: M-DK GY MICACEOUS PYRITIC CARBONACEOUS SHALE, + LT GY FRIABLE SST (AS IN BANDANNA FM ABOVE). THIN COAL SEAMS
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED MANTUAN EQUIV IN COMPLETION REPORT

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1984 Base Elevation: -1754 Thickness: 671
Geologic Description: M-DK GY VAR MICAC PY CARB SL CALC SH, LT GY F-M VAR MICAC PY CARB SST, WH F-M ARG GLAUC SST, LT-M GY + TAN VAR MICAC PY CARB GLAUC SL CALC SLTST
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	SHELLY ZONE	1545	-1315	73

Tectonic Structure:
Remarks ALSO CONTAINS ARKOSE + MINOR COAL. SHELL FRAGMENTS OCCUR

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1760# Thickness: ?6
Geologic Description: GN GY-BR GY DENSE CGL SST WITH MATRIX OF ALT BANDS OF GN GY F SST, GY BR + GY SLTST + DK GY SH. PBLS - CHERT, QZITE, FELDSPAR, GRANITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ERONANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:960 Base Elevation: -730 Thickness: 956
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1132 Base Elevation: -402 Thickness: 172
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV + COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1232 Base Elevation: -1002 Thickness: 100
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: ?STAGE 3 (NORVICK, 1974)

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y206
Basal Information: Depth to Base:1768 Base Elevation: -1538 Thickness: 636
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1419 -1189 139
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y207
Basal Information: Depth to Base:TD Base Elevation: -1760* Thickness:)222
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: STAGE 2-3 - STAGE 1-2 (NORVICK, 1974)

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -1760* Thickness:)858

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM, JOCHMUS FM + JERICHO FM

CONTROL POINT: MUTTABURRA 1

REFERENCE # A26 Y1
REFERENCE # A26 Y2
REFERENCE # A26 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PURSUIT OIL N.L.	RDH, CORE + WIRELINE	SF/55-9	22 48'33"S	144 31'35"E	+211	+215	-1234	1449	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MEYERS, N.A., AND SPENCER, L.
PURSUIT OIL N.L., PURSUIT MUTTABURRA NO.1 WELL COMPLETION REPORT
UNPUBLISHED REPORT. BMR FILE 69/2043
Page Publn Year: 1969
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:833 Base Elevation: -618 Thickness: 829
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:870 Base Elevation: -655 Thickness: 37
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:992 Base Elevation: -777 Thickness: 122
Geologic Description:
Reported Environment:
Interpreted Environment: SOME POORLY DEFINED FINING UP SEQUENCES PRESENT
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: UNCONFORMITY AT BASE. B'DARY CRITERIA: TOP - CHANGE FROM SST TO SLTST (SHOWN ON R & SP LOGS); BASE - CHANGES IN LOGS

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1079 Base Elevation: -864 Thickness: 87
Geologic Description:
Reported Environment:
Interpreted Environment: SEVERAL FINING UPWARDS SEQUENCES PRESENT (MOSTLY 10-15 M THICK)
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: BASE OF FM AT BASE OF SST, SHOWN ON SP LOG. ALTERNATIVE INTERPRETATION: BASE OF ARAMAC AT 1044 M (BASE OF DEEPEST COAL)

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1402 Base Elevation: -1187 Thickness: 323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1402 Base Elevation: -1187 Thickness: 410
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1234# Thickness: >47
Geologic Description: DACITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:570 Base Elevation: -355 Thickness: 566
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:658 Base Elevation: -443 Thickness: 88
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED BLYTHESDALE FM IN COMPLETION REPORT

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:690 Base Elevation: -475 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:696 Base Elevation: -481 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:744 Base Elevation: -529 Thickness: 48
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:833 Base Elevation: -618 Thickness: 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:843 Base Elevation: -628 Thickness: 10
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:870 Base Elevation: -655 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:882 Base Elevation: -667 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:1079 Base Elevation: -864 Thickness: 197
Geologic Description: LT GY F-C FAIRLY SRTD QZOSE SST (TRACE LITHICS), GN-GY V CARB MICAC OCCAS PY SLTST, M-DK GY CARB SH, BLK-DK BR DULL-SHINY BIT - SUB-BIT COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 914 -699 10 CA
COAL SEAMS: (1-3 M T'OUT
Tectonic Structure:
Remarks PLANT FOSSILS IN SHALE. COAL PARTLY SHALY. CYCLICAL PATTERN OF SST, SLTST, SH & THEN COAL CAN BE DISTINGUISHED

STRATIGRAPHY: UNDIFF LOWER PERMIAN Age: EARLY PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1402 Base Elevation: -1187 Thickness: 323
Geologic Description: LT GY-BR GY F-M FAIRLY SRTD LI SST, CGL SST, GY BR CARB COALY SIL MICROMICAC PARTLY CALC SLTST, BLK-LT GY BR CARB CALC COALY PARTLY GLAUC PY SH
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFF	1173	-958	12

Tectonic Structure:
Remarks: ALSO CONTAINS GY-BR GY ASHY TUFF WITH BRIGHT RED SPECKS

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -1234# Thickness: >47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:833 Base Elevation: -618 Thickness: 829
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:882 Base Elevation: -667 Thickness: 49
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks:

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:998 Base Elevation: -783 Thickness: 116
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV AND COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks: # BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:# Base Elevation: # Thickness: #
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANN-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1044 Base Elevation: -829 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y207
Basal Information: Depth to Base:1402 Base Elevation: -1187 Thickness: 358
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1173 -958 94
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:1402 Base Elevation: -1187 Thickness: 404
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & JOCHMUS FM

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y209
Basal Information: Depth to Base:TD Base Elevation: -1234* Thickness:)47
Geologic Description: DACITE AND/OR TUFF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: OORDONDO 1

REFERENCE # A11 Y1
REFERENCE # A11 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
CONORADA PETROL.	RDH, CORE + WIRELINE	SF/54-15	23 10'50"S	141 33'39"E	+122	+123	-1051	1174	?

REFERENCE: X1 HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3 Page Publn Year: 1981

Cross Reference:

REFERENCE: Y1 BUREAU OF MINERAL RESOURCES
CONORADA OORDONDO NO. 1, QUEENSLAND, BY CONORADA PETROLEUM CORPORATION
PETROLEUM SEARCH SUBSIDY ACTS PUBLICATION NO. 23 Page Publn Year: 1963

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1105 Base Elevation: -982 Thickness: 1104
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CORE NO. 17 (971-974 M) CONTAINS REWORKED PERMIAN COAL

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1170 Base Elevation: -1047 Thickness: 65
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GRANITE Age: ? Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -1051# Thickness:)4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:722 Base Elevation: -599 Thickness: 721
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WINTON AND WILGUNYA FMS OF COMPLETION REPORT

STRATIGRAPHY: TRANSITION ZONE Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:750 Base Elevation: -627 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOOKAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:1170 Base Elevation: -1047 Thickness: 420
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED LONGSIGHT SST IN COMPLETION REPORT

STRATIGRAPHY: GRANITE Age: PRECAMBRIAN Interpretation Code:Y104
Basal Information: Depth to Base:TD Base Elevation: -1051' Thickness: >4
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: RAND 1

REFERENCE # A28 Y1
REFERENCE # A28 Y2
REFERENCE # A28 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
LONGREACH OIL	RDH, CORE + WIRELINE	SF/55-13	23 07'23"S	144 43'06"E	+232	+236	-1750	1986	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
WARRIS, B.J.
LONGREACH OIL LTD. RAND NO. 1 WELL, QLD., WELL COMPLETION REPORT
LONGREACH OIL LTD. UNPUBLISHED REPORT. BMR FILE 69/2009
Page Publn Year: 1969
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code: X101
Basal Information: Depth to Base: 617 Base Elevation: -381 Thickness: 613
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code: X102
Basal Information: Depth to Base: 720 Base Elevation: -484 Thickness: 103
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code: X103
Basal Information: Depth to Base: 756 Base Elevation: -520 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code: X104
Basal Information: Depth to Base: 767 Base Elevation: -531 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:X105
Basal Information: Depth to Base:852 Base Elevation: -616 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:X106
Basal Information: Depth to Base:942 Base Elevation: -706 Thickness: 90
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X107
Basal Information: Depth to Base:1122 Base Elevation: -886 Thickness: 180
Geologic Description:
Reported Environment:
Interpreted Environment:FINING UPWARDS SEQUENCES INDICATED ON LITHOLOGIC & GAMMA-RAY LOGS
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X108
Basal Information: Depth to Base:1204 Base Elevation: -968 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:FINING UPWARDS SEQUENCES INDICATED ON LITHOLOGIC & GAMMA-RAY LOGS
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -1750* Thickness: >782
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X110
Basal Information: Depth to Base:TD Base Elevation: -1750* Thickness: >864
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:617 Base Elevation: -381 Thickness: 613
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY-ADORI Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:765 Base Elevation: -529 Thickness: 148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HOORAY SST TO ADORI SST. CALLED BLYTHESDALE FM IN W.C.R.

STRATIGRAPHY: RIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:849 Base Elevation: -613 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:942 Base Elevation: -706 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:1122 Base Elevation: -886 Thickness: 180
Geologic Description: WH F-M ANG-SUBRND QZ CARB & MICAC SST WITH INTERBEDS DK GY CARB SLTSTS & BLK VITREOUS COAL
Reported Environment: NON-MARINE, MAINLY FLUVIAL & ALLUVIAL PLAIN CONDITIONS. SWAMP & MARSH ENVIRONMENTS PREVALENT GIVING RISE TO NUMEROUS COAL BEDS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1013	-777	16
COAL	1044	-808	2
COAL INTERVAL	1113	-877	54
COAL	1122	-886	3

Tectonic Structure:
Remarks

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1265 Base Elevation: -1029 Thickness: 143
Geologic Description: DK GY-BR CARB & MICAC SHALES INTBDD WITH SST SIMILAR TO BANDANNA FM & BLK VITREOUS COAL
Reported Environment: SIMILAR TO BANDANNA FM EXCEPT FOR REDUCTION IN FLUVIAL ACTIVITY RESULTING IN LESS SST DEPOSITION
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	1147	-911	19
COAL	1168	-932	3
COAL	1179	-943	1.5 CA
COAL	1192	-956	1 CA

Tectonic Structure:
Remarks CALLED "REIDS DOME BEDS" IN W.C.R.

STRATIGRAPHY: JOE JOE GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1861 Base Elevation: -1625 Thickness: 596
Geologic Description: INTBDD LT GY F-M & CGL ANG-SUBRND SSTS & DK GY-BR CARB & MICAC SHALES AND MINOR BLK COAL

Reported Environment: NON-MARINE AND PROBABLY QUITE RAPID DEPOSITION WITH CLAYEY & CONGLOMERATIC SANDS DEVELOPING AS ALLUVIAL FANS
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1305	-1069	1.5 CA
COAL	1335	-1099	1 CA

Tectonic Structure:
Remarks CALLED JOE JOE FM IN W.C.R. ALLUVIAL FANS PROBABLY FILL LOW AREAS PRODUCED BY DOWNWARPING OF MONOCLINE

STRATIGRAPHY: UNDIFF CARBONIFEROUS Age: CARBONIFEROUS Interpretation Code:Y108
Basal Information: Depth to Base:TD Base Elevation: -1750* Thickness: >125
Geologic Description: SANDSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:942 Base Elevation: -706 Thickness: 938
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:1122 Base Elevation: -886 Thickness: 180
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:1191 Base Elevation: -955 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y206
Basal Information: Depth to Base:1786 Base Elevation: -1550 Thickness: 595
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness
	TUFF, EDIE TUFF MB	1381	-1145	147

Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y207
Basal Information: Depth to Base:TD Base Elevation: -1750* Thickness: >200
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -1750* Thickness: >864
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks CONTAINS ARAMAC CM, JOCHMUS FM & JERICHO FM

CONTROL POINT: RAVENSBOURNE 1

REFERENCE # A57 Y1
REFERENCE # A57 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMERICAN O/S PET	RDH, CORE + WIRELINE	SG/55-2	24 50'06"S	145 37'08"E	+339	+343	-2015	2358	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
SIROVS, M.G.
AMERICAN OVERSEAS PETROLEUM LTD RAVENSBOURNE 1, AUTHORITY TO PROSPECT 13BP, QLD, WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 68/2027
Page Publn Year: 1968
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1093 Base Elevation: -750 Thickness: 1089
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1249 Base Elevation: -906 Thickness: 156
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1338 Base Elevation: -995 Thickness: 89
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1530 Base Elevation: -1187 Thickness: 192
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks POSSIBLY JERICHO FM

STRATIGRAPHY: EASTWOOD BEDS Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:TD Base Elevation: -2015* Thickness: >820
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:437 Base Elevation: -94 Thickness: 433
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ALLARU MDST, TOOLEBUC LST, & WALLUMBILLA FM

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:545 Base Elevation: -202 Thickness: 108
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:636 Base Elevation: -293 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:688 Base Elevation: -345 Thickness: 52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:821 Base Elevation: -478 Thickness: 133
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1002 Base Elevation: -659 Thickness: 181
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1047 Base Elevation: -764 Thickness: 45

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1093 Base Elevation: -750 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:1125 Base Elevation: -782 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:1250 Base Elevation: -907 Thickness: 125
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1530 Base Elevation: -1187 Thickness: 280
Geologic Description: GY-DR-BLK LOCALLY BIOT SH & CLST WITH CARB STREAKS, GY BR PARTY SANDY SLTST & VF BIOT ?TFAC SST, WH-GY GN F & M-C FAIRLY SRTD QZ SST (COALY LAM)
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COALY INTERVAL 1268 -925 2 CA
Tectonic Structure:
Remarks UNCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF LOWER DEVON Age: DEVONIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -2015# Thickness: 1828
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: ROWEN LYNN 2

REFERENCE # A6 Y1
REFERENCE # A6 Y2
REFERENCE # A6 X1

	Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
	PRIVATE	WATER BORE	SF/54-4	20 58'00"S	143 15'00"E	+243	+243	-674	917	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
VINE, R.R.
RICHMOND, QLD. 1:250,000 GEOLOGICAL SERIES
BUREAU OF MINERAL RESOURCES, AUSTRALIA, EXPLANATORY NOTES SF/54-4
Page Publn Year: 1970
Cross Reference:

REFERENCE: Y2
BUREAU OF MINERAL RESOURCES
ROWEN LYNN NO.2 GAMMA-RAY & INTERPRETIVE LOG
GREAT ARTESIAN BASIN, QLD., EXPERIMENTAL BORE LOGGING PROGRAMME
Page Publn Year: 1964
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: ERDMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:618 Base Elevation: -375 Thickness: 618
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:865 Base Elevation: -622 Thickness: 247
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:TD Base Elevation: -674 * Thickness:)52
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:377 Base Elevation: -134 Thickness: 377
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:439 Base Elevation: -196 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:466 Base Elevation: -223 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:519 Base Elevation: -276 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:618 Base Elevation: -375 Thickness: 99
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y106
Basal Information: Depth to Base:864 Base Elevation: -621 Thickness: 246
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -674 * Thickness:)53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y201
Basal Information: Depth to Base:375 Base Elevation: -132 Thickness: 375
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LONGSIGHT SST Age: JURASSIC Interpretation Code:Y202
Basal Information: Depth to Base:468 Base Elevation: -225 Thickness: 93
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y203
Basal Information: Depth to Base 548 Base Elevation: -305 Thickness: 80
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUNDAMBA FM Age: JURASSIC Interpretation Code:Y204
Basal Information: Depth to Base:650 Base Elevation: -407 Thickness: 102
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BROOKWOOD BEDS Age: TRIASSIC Interpretation Code:Y205
Basal Information: Depth to Base:862 Base Elevation: -619 Thickness: 212
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN

STRATIGRAPHY: BASEMENT Age: PRE-TRIASSIC Interpretation Code:Y206
Basal Information: Depth to Base:TD Base Elevation: -674 * Thickness:)55
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SALTERN CREEK 1

REFERENCE # A30 Y1
REFERENCE # A30 Y2
REFERENCE # A30 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
LONGREACH OIL	RDH, CORE + WIRELINE	SF/55-13	23 20'54"S	144 56'24"E	+230	+234	-1280	1514	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
MOTT, W.D., AND ASSOCIATES
SALTERN CREEK NO.1 WELL COMPLETION REPORT, DRUMMOND BASIN, A.T.P. 87P. QUEENSLAND
LONGREACH OIL LTD UNPUBLISHED REPORT. BMR FILE 64/4042
Page Publn Year: 1964
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN CALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: CALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:725 Base Elevation: -491 Thickness: 721
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X102
Basal Information: Depth to Base:826 Base Elevation: -592 Thickness: 101
Geologic Description:
Reported Environment:
Interpreted Environment:FINING UP CYCLES - FLUVIAL FLOOD-PLAIN OR UPPER DELTA PLAIN
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks UNCONFORMITIES AT TOP & BASE. TOP OF FM PICKED AT TOP COAL BED & TOP OF FINING-UP CYCLES ON SP

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:860 Base Elevation: -626 Thickness: 34
Geologic Description:
Reported Environment:
Interpreted Environment:POORLY DEFINED FINING UP CYCLES
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP OF FM PICKED AT SHIFT ON GAMMA-RAY TO SHALE LINE. BASE OF FM AT BOTTOM COAL

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1454 Base Elevation: -1220 Thickness: 594
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1454 Base Elevation: -1220 Thickness: 628
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: DEVONIAN-CARB Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1280* Thickness: >60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:428 Base Elevation: -194 Thickness: 424
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TAMBO & ROMA FORMATIONS OF WELL COMPLETION REPORT

STRATIGRAPHY: HOOKAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:506 Base Elevation: -272 Thickness: 78
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED TRANSITION BEDS + HOOGA SST OF BLYTHESDALE GROUP IN WELL COMPLETION REPORT

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:533 Base Elevation: -299 Thickness: 27
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED FOSSIL WOOD BEDS OF BLYTHESDALE GP IN WELL COMPLETION REPORT

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:561 Base Elevation: -327 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED GUBBERAMUNDA SST OF BLYTHESDALE GROUP IN WELL COMPLETION REPORT

STRATIGRAPHY: WALLOON CM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:635 Base Elevation: -401 Thickness: 74
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:762 Base Elevation: -528 Thickness: 127
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:1036 Base Elevation: -802 Thickness: 274
Geologic Description: DK GY SL CALC MICAC PY VERY CARB SH, BLK COAL SEAMS, GY-BR CARB CALC SLTST, LT GY-WH F-M CALC FRIABLE SST, BR CARB CALC PY VAR TFAC SH & SLTST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL INTERVAL	769	-535	5 CA
COAL	787	-553	9 CA
COAL	814	-580	3 CA
COAL INTERVAL	851	-617	26 CA

Tectonic Structure:
Remarks CA 1.5 M COAL SEAM AT 797 M. UPPER BANDANNA (LATE PERM.) SPORES, 799-808M. ?STAGE 5 - UPPER STAGE 2-3 (NORVICK, 1974)

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1074 Base Elevation: -840 Thickness: 38
Geologic Description: LT GY, F-M GRAINED, LITHIC, SLIGHTLY CARBONACEOUS SANDSTONE, AND MINOR LT-M GREY, CARBONACEOUS, SLIGHTLY CALCAREOUS SILTSTONE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED MANTUAN FORMATION IN WELL COMPLETION REPORT

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1454 Base Elevation: -1220 Thickness: 380
Geologic Description: LT-M GY SL CALC CARB LI SH, LT GY F-M CARB LI SST, LT GY-WH F-M LI SL CARB & CALC SST, LT GY F ARG SST & GY-BR SILTY SH (BOTH TFAC CARB SL CALC)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PALYNOLOGICAL SAMPLE	1411	-1174	3

Tectonic Structure:
Remarks ALSO, M-DK GY SL CALC CARB SILTY SH, + TRACE VARICOLORED BRITTLE RESINOUS TFAC SH. UPPER STAGE 2 (NORVICK, 1974)

STRATIGRAPHY: DRUMMOND GP Age: DEVONIAN-CARB Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1280± Thickness:)60
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:762 Base Elevation: -528 Thickness: 758
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y202
Basal Information: Depth to Base:818 Base Elevation: -584 Thickness: 56
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINELA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINELA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y204
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y205
Basal Information: Depth to Base:851 Base Elevation: -617 Thickness: 33
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y206
Basal Information: Depth to Base:1370 Base Elevation: -1136 Thickness: 519
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MB 1036 -802 114
Tectonic Structure:
Remarks

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y207
Basal Information: Depth to Base:1454 Base Elevation: -1220 Thickness: 84
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF DEVONIAN-CARB Age: DEVONIAN-CARB Interpretation Code:Y208
Basal Information: Depth to Base:TD Base Elevation: -1280* Thickness:)60

Geologic Description: QUARTZITE + TUFF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: SPRINGSURE 13

REFERENCE # A40

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH	SG/55-3	24 16'00"S	147 10'00"E	+381	+381	-508	889	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALAEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 77 Page 147-163 Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y101
Basal Information: Depth to Base:44 Base Elevation: +337 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:44 Base Elevation: +337 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:44 Base Elevation: +337 Thickness: 44
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONSISTS OF COLINLEA SST OF GEBBIE SUB-GROUP

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:774 Base Elevation: -393 Thickness: 730
Geologic Description: LT-DK GY + BR PARTLY PBLY-CGL SLTST + SH, GN-GY VF-M PARTLY PBLY LAB-SUBLAB SST, LT-DK GY CARB MICAC PARTLY SANDY PBLY SLTST, RED-BR TO GN TUFF
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO CONTAINS LT GY-BLK THINLY BDD + VARVED MDST + SH, MINOR LST, CGL. SSST XBDD OR MASSIVE

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:774 Base Elevation: -393 Thickness: 730
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

STRATIGRAPHY: DUCABROOK FM Age: CARBONIFEROUS Interpretation Code:Y106
Basal Information: Depth to Base:TD Base Elevation: -508 ± Thickness:)115

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: STAFFORD 1

REFERENCE # A61 Y1
REFERENCE # A61 Y2
REFERENCE # A61 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
PHILLIPS-SUNRAY	RDH, CORE + WIRELINE	SG/55-5	25 17'33"S	145 26'03"E	+353	+357	-2784	3141	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
NETZEL, R.K.
PHILLIPS-SUNRAY STAFFORD NO.1, AUTHORITY TO PROSPECT 109P, QUEENSLAND, WELL COMPLETION REPORT
PHILLIPS AUSTRALIAN OIL CO. UNPUBLISHED REPORT. BMR FILE 66/4208 Page Publn Year: 1967
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
MATHUR, S.P., AND SEXTON, M.J.
CENTRAL EROMANGA BASIN SEISMIC SURVEY, QUEENSLAND, 1981: PREVIEW REPORT
BUREAU OF MINERAL RESOURCES, GEOLOGY & GEOPHYSICS RECORD 1981/33 Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1446 Base Elevation: -1099 Thickness: 1442
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1557 Base Elevation: -1200 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1651 Base Elevation: -1294 Thickness: 94
Geologic Description: TOP MARKED BY RED-BROWN CLAYEY SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X104
Basal Information: Depth to Base:2060 Base Elevation: -1703 Thickness: 409
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:2745 Base Elevation: -2388 Thickness: 685
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features.	Feature	Depth	Elevation	Thickness
	SHALE/SILTSTONE MB	2675	-2318	615
	SANDSTONE MEMBER	2745	-2388	70

Tectonic Structure:
Remarks

STRATIGRAPHY: CODLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:3024 Base Elevation: -2667 Thickness: 279
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -2784* Thickness:)117
Geologic Description: RED BEDS
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:750 Base Elevation: -393 Thickness: 746
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:940 Base Elevation: -583 Thickness: 190
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1015 Base Elevation: -658 Thickness: 75
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features:	Feature	Depth	Elevation	Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1067 Base Elevation: -710 Thickness: 52
Geologic Description:

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1215 Base Elevation: -858 Thickness: 148
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED WALLOON FM IN COMPLETION REPORT

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1411 Base Elevation: -1054 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DISCONFORMITY AT BASE

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1557 Base Elevation: -1200 Thickness: 146
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks DISCONFORMITY AT BASE

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:1626 Base Elevation: -1269 Thickness: 69
Geologic Description: DK GY CARB MICAC SH & INTBDD CLAYS; INTBDD GY-WH VF-F & M-VC SSIS, GY-BLK MICAC SH, M-DK CARB SH, & DK BR-BLK MICAC SH, LT GY SH & LT BR CALC SH
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks MAJOR UNCONFORMITY AT BASE. PALYNOSTRATIGRAPHY: UPPER STAGE 5 (1612-1614 M) (NORVICK, 1974)

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y109
Basal Information: Depth to Base:1996 Base Elevation: -1639 Thickness: 370
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:2750 Base Elevation: -2393 Thickness: 754
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:Y111
Basal Information: Depth to Base:3024 Base Elevation: -2667 Thickness: 274
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: SANDSTONE Age: DEVONIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -2784* Thickness:)117
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y201
Basal Information: Depth to Base:750 Base Elevation: -393 Thickness: 746
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CADNA-OWIE FM Age: CRETACEOUS Interpretation Code:Y202
Basal Information: Depth to Base:841 Base Elevation: -484 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y203
Basal Information: Depth to Base:956 Base Elevation: -599 Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y204
Basal Information: Depth to Base:1041 Base Elevation: -684 Thickness: 85
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y205
Basal Information: Depth to Base:1069 Base Elevation: -712 Thickness: 28
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y206
Basal Information: Depth to Base:1215 Base Elevation: -859 Thickness: 146
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y207
Basal Information: Depth to Base:1411 Base Elevation: -1054 Thickness: 196
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y208
Basal Information: Depth to Base:1556 Base Elevation: -1199 Thickness: 145
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1865 Base Elevation: -1508 Thickness: 309
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y210
Basal Information: Depth to Base:2060 Base Elevation: -1703 Thickness: 195
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y211
Basal Information: Depth to Base:2750 Base Elevation: -2393 Thickness: 690
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BURY LST Age: DEVONIAN Interpretation Code:Y212
Basal Information: Depth to Base:3030 Base Elevation: -2673 Thickness: 280
Geologic Description:

CONTROL POINT: TAMBO 1-1A

REFERENCE # A49

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-2	24 33'00"S	146 36'00"E	+541	+543	-359	902	

REFERENCE: WALLIN, C.I.
STRATIGRAPHIC DRILLING REPORT - GSQ TAMBO 1-1A
QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 76 Page 411-415 Publn Year: 1975

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:42 Base Elevation: +501 Thickness: 40
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PRECIPICE SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:111 Base Elevation: +432 Thickness: 69
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:522 Base Elevation: +21 Thickness: 411
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:575 Base Elevation: -32 Thickness: 53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:699 Base Elevation: -155 Thickness: 123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:774 Base Elevation: -231 Thickness: 76

Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUNFARDO FM Age: DEVONIAN Interpretation Code:%213
Basal Information: Depth to Base:TD Base Elevation: -2784# Thickness:)111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

Geologic Description: GN-GY VF-M FAIRLY SRTD LAB MICAC X-BDD SST, LT GY-LT GN GY + DK GY F-VC +CGL FAIRLY-POORLY SRTD LAB-QZOSE MICAC SST, BLK CARB SH, MINOR PBL CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
LIMESTONE 750 CA -287
Tectonic Structure:
Remarks ALSO CONTAINS LT GN-GY BENTONITE + TUFF, LT GN-GY MDST + SLTST, + VERY MINOR SANDY LST

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:774 Base Elevation: -231 Thickness: 76
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:828 Base Elevation: -285 Thickness: 54
Geologic Description: DK GY-BLK SH + M-DK GY SLTST INTLAMD WITH LT GY VF WELL SRTD LAB SST, GN-GY + LT GY VF-M FAIRLY-WELL SRTD LAB-SUBLAB SST, CR-LT GY GN BENT + TF.
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ALSO CONTAINS MINOR LST.

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:849 Base Elevation: -306 Thickness: 21
Geologic Description: GN TO GN-GY + LT GY VF-M WELL-FAIRLY SRTD, SUBROUNDED-SUBANGULAR, LAB-SUBLAB SST WITH CARB + MICAC PARTINGS, DK GY SLTST, + MINOR CGL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:849 Base Elevation: -306 Thickness: 79
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH + PEAWADDY FM

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: -359 ± Thickness:)53
Geologic Description: LT GY-LT BR VF-VC FAIR-POORLY SRTD SUBLAB-QZOSE PARTLY PBLY SST WITH ARG MATRIX, LT PBL CGL, DK GY-BLK SLTST + BLK MOSTLY DULL PY-RICH COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 891 -348 4
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -359 ± Thickness:)53
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -359 m Thickness: >128
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM + GEBBIE SUB-GROUPS (AS ABOVE)

CONTROL POINT: TAMBO 3

REFERENCE # A39

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
GEOL. SURV. QLD.	DDH, CORE + WIRELINE	SG/55-2	24 19'00"S	146 58'00"E	+494	+494	+57	437	

REFERENCE: GRAY, A.R.G.
STRATIGRAPHIC RELATIONSHIPS OF LATE PALAEOZOIC SEDIMENTS BETWEEN SPRINGSURE AND JERICHO
QUEENSLAND GOVERNMENT MINING JOURNAL, VOLUME 77 Page 147-163 Publn Year: 1976

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:I01
Basal Information: Depth to Base:54 Base Elevation: +440 Thickness: 54
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Y102
Basal Information: Depth to Base:122 Base Elevation: +372 Thickness: 68
Geologic Description: INTBDD LT GN-GY F-M LAB SST, SLTST, SH, + MINOR TUFF + CGL. SANDY LIMESTONE INTBDD WITH SST IN LOWER PART
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACKWATER GP Age: PERMIAN Interpretation Code:Y103
Basal Information: Depth to Base:122 Base Elevation: +372 Thickness: 68
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BANDANNA FM

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Y104
Basal Information: Depth to Base:165 Base Elevation: +329 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:213 Base Elevation: +281 Thickness: 48
Geologic Description: LT GN-GY F-M SUBLAM-LAB SST, + MINOR SLTST, SH, TUFF + CGL. CARB + MICAC PARTINGS IN LOWER PART, FOSSIL SHELLS SCATTERED T'OUT UPPER PART
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
MANTUAN PRODUCTUS BD 180 +314
Tectonic Structure:
Remarks

STRATIGRAPHY: BLENHEIM SUB-GP Age: PERMIAN Interpretation Code:Y106

Basal Information: Depth to Base:213 Base Elevation: +281 Thickness: 91
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLACK ALLEY SH + PEAWADDY FM

STRATIGRAPHY: COLINLEA SST Age: PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:336 Base Elevation: +158 Thickness: 123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GEBBIE SUB-GP Age: PERMIAN Interpretation Code:Y108
Basal Information: Depth to Base:336 Base Elevation: +158 Thickness: 123
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS COLINLEA SST

STRATIGRAPHY: BACK CREEK GP Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:336 Base Elevation: +158 Thickness: 214
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS BLENHEIM + GEBBIE SUB-GROUPS (AS ABOVE)

STRATIGRAPHY: JERICHO FM Age: CARB-PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: +57 # Thickness: >101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:TD Base Elevation: +57 # Thickness: >101
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JERICHO FM

CONTROL POINT: THUNDERBOLT 1

REFERENCE # A23 X1
REFERENCE # A23 Y2
REFERENCE # A23 Y1

Organisation	Type	Mapnc	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMERADA PET CORP	RDH, CORE + WIRELINE	SF/55-9	22 22'02"S	145 80'10"E	+226	+232	-1379	1611	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
AMERADA PETROLEUM CORPORATION
WELL COMPLETION REPORT, AMERADA THUNDERBOLT NO.1
UNPUBLISHED COMPANY REPORT. BMR FILE 67/4245
Page Publn Year: 1967
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code: X101
Basal Information: Depth to Base: 12 Base Elevation: +220 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code: X102
Basal Information: Depth to Base: 390 Base Elevation: -158 Thickness: 378
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code: X103
Basal Information: Depth to Base: 881 Base Elevation: -649 Thickness: 491
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code: X104
Basal Information: Depth to Base: 1034 Base Elevation: -802 Thickness: 153
Geologic Description: UNCONFORMITY AT BASE
Reported Environment:
Interpreted Environment: POSSIBLE FINING-UP CYCLES ON GAMMA-RAY LOG
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks TOP & BASE PICKED AT MARKED CHANGES IN WIRELINE LOGS. ALTERNATIVE FM TOP PICK AT 893 M (TOP OF FIRST COAL).

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1608 Base Elevation: -1376 Thickness: 574
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks ARAMAC CM ABSENT ALTHOUGH THIN SEQUENCE OF ARAMAC POSSIBLY EXISTS BETWEEN 1030-1050 M

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1379# Thickness:)3
Geologic Description: DACITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:Y101
Basal Information: Depth to Base:12 Base Elevation: +220 Thickness: 6
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:243 Base Elevation: -11 Thickness: 231
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TOOLEBUC "MEMBER" & ROMA FORMATION OF COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:255 Base Elevation: -23 Thickness: 12
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:296 Base Elevation: -64 Thickness: 41
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:312 Base Elevation: -80 Thickness: 16
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:344 Base Elevation: -112 Thickness: 32
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:389 Base Elevation: -157 Thickness: 45
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:577 Base Elevation: -345 Thickness: 188
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:707 Base Elevation: -475 Thickness: 130
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:881 Base Elevation: -649 Thickness: 174
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1050 Base Elevation: -818 Thickness: 169
Geologic Description: WH-LT GY F-C SUBANGULAR-ANGULAR MICAC CARB SST WITH CLAY MATRIX AND BEDS OF COAL & DK GY CARB SLTST. RARE LT GY CARB ARG SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 895 -663 1-2
COAL INTERVAL 976 -744 40 CA
Tectonic Structure:
Remarks PALYNOLOGY: 896-916 M - UPPER STAGE 5, 1011-14 M - STAGE 5 (UNDIFF) (MORVICK, 1974)

STRATIGRAPHY: UNDIFF U.CARB-L.PERM Age: L.CARB-E.PERM Interpretation Code:Y112
Basal Information: Depth to Base:1608 Base Elevation: -1376 Thickness: 558
Geologic Description: UPPER: INTBDD SIL MICAC SH, WH F-C MICAC ARG SST, SLTST, CGL, COAL. LOWER: WH F-C SL MICAC ARG SST, COMM TFAC, DK GY-BLK CARB SH, SLTST, F SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
PAL: STAGE 3	1097	-865	61
PAL: UPPER STAGE 2-3	1132	-900	
PAL: UPPER STAGE 2	1431	-1199	230
PAL: LOWER STAGE 2	1540	-1308	83

Tectonic Structure:
Remarks PALYNOLOGICAL STAGE INFORMATION FROM MORWICK, 1974

STRATIGRAPHY: BASEMENT Age: PRE-LATE CARB Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -1379* Thickness:)3
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure.
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:390 Base Elevation: -159 Thickness: 384
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:579 Base Elevation: -347 Thickness: 189
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y203
Basal Information: Depth to Base:625 Base Elevation: -393 Thickness: 46
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DUNDA BEDS Age: TRIASSIC Interpretation Code:Y204
Basal Information: Depth to Base:707 Base Elevation: -475 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y205
Basal Information: Depth to Base:881 Base Elevation: -649 Thickness: 174

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1034 Base Elevation: -902 Thickness: 153
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV & COLINLEA SST EQUIV.

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOCHNUS FM Age: CARB-PERMIAN Interpretation Code:Y209
Basal Information: Depth to Base:1484 Base Elevation: -1252 Thickness: 456
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1205 -973 155
Tectonic Structure:
Remarks DEPTH TO BASE UNCERTAIN

STRATIGRAPHY: JERICHO FM Age: CARBONIFEROUS Interpretation Code:Y210
Basal Information: Depth to Base:1608 Base Elevation: -1376 Thickness: 124
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y211
Basal Information: Depth to Base:1608 Base Elevation: -1376 Thickness: 574
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:

Remarks CONTAINS JOCHMUS & JERICHO FMS

STRATIGRAPHY: DACITE Age: ? Interpretation Code:Y212
Basal Information: Depth to Base:TD Base Elevation: -1379* Thickness: 13
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: TOWERHILL A-1

REFERENCE # A12 Y1
REFERENCE # A12 Y2
REFERENCE # A12 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMOCO AUST EXPL	RDH, CORE + WIRELINE	SF/55-5	21 43'06"S	144 40'50"E	+295	+299	-1190	1489	?

REFERENCE: X1 THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1 AMOCO AUSTRALIA EXPLORATION COMPANY
COMPOSITE WELL LOG, AMOCO AUSTRALIA EXPLORATION COMPANY, TOWERHILL A-1
UNPUBLISHED. BMR FILE 67/4271
Page Publn Year: 1967
Cross Reference: NORWICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y2 HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: UNDIFF CAINOZOIC Age: CAINOZOIC Interpretation Code:X101
Basal Information: Depth to Base:42 Base Elevation: +257 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X102
Basal Information: Depth to Base:563 Base Elevation: -264 Thickness: 521
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X103
Basal Information: Depth to Base:1050 Base Elevation: -751 Thickness: 487
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1193 Base Elevation: -894 Thickness: 143
Geologic Description: APPROX. 20% COAL (BASED ON BULK DENSITY LOG)
Reported Environment:
Interpreted Environment: FINING-UP SEQUENCES SUGGESTED BY LOGS I.E. CHANNEL-FILL SAND, OVERBANK SHALE, BACKSWAMP SHALE & COAL
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks B'DARY CRITERIA: TOP - CHANGE IN R, SP & GAMMA LOGS; BASE - ABOVE U. STAGE 2-3 SPORES AT 1103 M, CHANGE IN LOGS

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:1490 Base Elevation: -1181 Thickness: 287
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1190 Thickness:)9
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: QUATERNARY Age: QUATERNARY Interpretation Code:Y101
Basal Information: Depth to Base:42 Base Elevation: +257 Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y102
Basal Information: Depth to Base:328 Base Elevation: -29 Thickness: 286
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS TAMBO FM, TOOLEBUC MB AND ROMA FM OF WELL COMPLETION REPORT

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y103
Basal Information: Depth to Base:350 Base Elevation: -51 Thickness: 22
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:393 Base Elevation: -94 Thickness: 43
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF INJUNE CK GP

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:404 Base Elevation: -105 Thickness: 11
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF INJUNE CK GP

STRATIGRAPHY: BIRKHEAD FM EQUIV Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:466 Base Elevation: -167 Thickness: 62
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PART OF INJUNE CK GP

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y107
Basal Information: Depth to Base:563 Base Elevation: -264 Thickness: 97
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:733 Base Elevation: -434 Thickness: 170
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y109
Basal Information: Depth to Base:867 Base Elevation: -568 Thickness: 134
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y110
Basal Information: Depth to Base:1049 Base Elevation: -750 Thickness: 182
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER PERMIAN Age: LATE PERMIAN Interpretation Code:Y111
Basal Information: Depth to Base:1194 Base Elevation: -895 Thickness: 145
Geologic Description: WH-LT GY VF-F QZ SST (CARB & COALY LAMS), BLK VITREOUS BRITTLE COAL, M-DK GY CARB SH, VF PARTLY SILTY SST, LT GY BR CARB SLTST
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL INTERVAL: 3 SMS 1075 -776 20
COAL INTERVAL: 2 SMS 1111 -812 9
COAL INTERVAL: B SMS 1182 -883 54
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: ?STAGE 5 (AT 1052 M) - UPPER STAGE 2-3 (AT 1193 M) (NORVICK, 1974)

STRATIGRAPHY: UNDIFF U.CARB-L.PERM Age: L.CARB-E.PERM Interpretation Code:Y112
Basal Information: Depth to Base:1481 Base Elevation: -1182 Thickness: 287
Geologic Description: C-VC, M-C, F, F-M AND VF-F SSTS, GY CARB SHALE, SILICEOUS SHALE, SILTSTONE AND TUFFITE. VARIABLY TUFFACEOUS. SOME COAL
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
TUFFITE	1375	-1076	32
COAL	1380	-1001	1 CA
COAL	1338	-1039	2 CA
COAL	1367	-1068	2.5 CA

Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 2 (1311-1354 M) & PROBABLY UPPER STAGE 2 (AT 1417 M) (NORVICK, 1974)

STRATIGRAPHY: BASEMENT Age: PRE-CARB Interpretation Code:Y113
Basal Information: Depth to Base:TD Base Elevation: -1190* Thickness: >8
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:562 Base Elevation: -263 Thickness: 558
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:735 Base Elevation: -436 Thickness: 173
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y203
Basal Information: Depth to Base:796 Base Elevation: -497 Thickness: 61
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: DUNDA BEDS Age: TRIASSIC Interpretation Code:Y204
Basal Information: Depth to Base:867 Base Elevation: -568 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: REWAN GP Age: TRIASSIC Interpretation Code:Y205

Basal Information: Depth to Base:1049 Base Elevation: -750 Thickness: 182
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y206
Basal Information: Depth to Base:1193 Base Elevation: -894 Thickness: 144
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV AND COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y207
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y208
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINELA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: JOCHMUS FM Age: CARBONIFEROUS Interpretation Code:Y209
Basal Information: Depth to Base:1481 Base Elevation: -1182 Thickness: 288
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
EDIE TUFF MEMBER 1263 -964 70
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:Y210
Basal Information: Depth to Base:1481 Base Elevation: -1182 Thickness: 288
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS JOCHMUS FM

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y211
Basal Information: Depth to Base:TD Base Elevation: -1190* Thickness:)8
Geologic Description: IGNIMBRITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness

Tectonic Structure:
Remarks

CONTROL POINT: VALETTA 1

REFERENCE # A47

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
BEAVER-PEXA OIL	RDM, CORED	SG/55-6	25 02'50"S	146 36'00"E	+544	+550	-793	1340	

REFERENCE: LESLIE, W C.
VALETTA NO.1, WELL COMPLETION REPORT, BEAVER-PEXA OIL NL
UNPUBLISHED WELL COMPLETION REPORT BEAVER-PEXA OIL, BMR FILE 70/264 Page Publn Year: 1970
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES RECORD 1974/141

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: HOOPAY SST Age: JURASSIC Interpretation Code:Y101
Basal Information: Depth to Base:84 Base Elevation: +467 Thickness: 77
Geologic Description: COLOURLESS SST, C TO CGL GRAIN, MASS AND POORLY CONSOL, GRAINS OZOSE. LOWER PART FINE GRAINED, POORLY CONSOL
Reported Environment: FINE-GRAINED DEP IN LACUSTRINE ENVIRON BY MATURE STREAMS,LATER RENEWED UPLIFT,WITH FAST-FLOWING STREAMS,DEP COARSER GRAINS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:151 Base Elevation: +397 Thickness: 70
Geologic Description: SOFT, GY SH,OFTEN MICAC AND GRADED INTO SLTST,SOME CARB MATERIAL FEW THIN FINE-GRAINED SST LAYERS,GRADES DOWN INTO ADORI SST
Reported Environment: DEPOSITED IN LACUSTRINE ENVIRON,WITH LOW ENERGY ANAEROBIC CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:233 Base Elevation: +315 Thickness: 82
Geologic Description: M TO C GRAINED SST, PREDOM QZ, WITH LAB MATERIAL. MINOR CARB MATERIAL INSST. TOP 30 M HAS SHALY INTERBEDS
Reported Environment: C SED AND POOR SRTING INDICATE HIGH ENERGY FLUVIATILE ENVIRONMENT
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:319 Base Elevation: +229 Thickness: 86
Geologic Description: LT GY CALC SLTST AND SH WITH SOME INTBDD SST,IN THIN LAYERS,WITH F TO C GRAINS FEW THIN ZONES OF CARB MATERIAL
Reported Environment: AREA OF RESTRICTED DRAINAGE,IN A LACUSTRINE ENVIRON,WITH SHORT PERIODS OF RESTRICED DRAINAGE
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y105
Basal Information: [illegible] to Base:741 Base Elevation: -193 Thickness: 422
Geologic Description: F TO C GRAINED SST,WITH OCCAS INTBDD SH AND SLTST.CGL MATERIAL T'OUT.SMALL AMOUNTS OF CARB TOWARD BASE OF UNIT,WITH THIN COAL BDS
Reported Environment: SST DEPOSITED IN FLUVILATE TO LACUSTRINE ENVIRON,AND FROM HIGH ENERGY TOLOW ENERGY ANAEROBIC CONDITIONS
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAM 560 -12 1 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y106

Basal Information: Depth to Base:1054 Base Elevation: -506 Thickness: 313
Geologic Description: PREDOM LT GY MICAC SLTST WITH INTBDD LT-M GY SH. LOWER SH IS RD-BR. MINOR SST SCATTERED T'OUT IS F GRAINED. THIN CARB ZONE AT BASE OF UNIT
Reported Environment: DEP IN FLUV TO LACUSTRINE ENVIRON WITH LOW TO MODERATE ENERGY
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Yi07
Basal Information: Depth to Base:1216 Base Elevation: -668 Thickness: 162
Geologic Description: MEDIUM TO C GRAINED SST,GEN QZOSE WITH POOR CONSOL. VERY POROUS,SMALL AMOUNTS OF ARG CEMENT. SOME PROMINENT SH BDS
Reported Environment: FLUV DEP FROM QZ RICH SOURCE UNDER HIGH ENERGY CONDITIONS,WITH SLOW DEPOSITION AND PERIODS OF WAVE ACTION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM Age: PERMIAN Interpretation Code:Yi08
Basal Information: Depth to Base:1281 Base Elevation: -733 Thickness: 65
Geologic Description: SST AND SLTST WITH INTBDD SH. SLTST IS OCCAS CARB. LOWER SST POORLY SRTD
Reported Environment: DEP UNDER FLUCTUATING WATER CONDITIONS. FRESH WATER LACUSTRINE DEPOSIT WITH OCCAS PERIODS OF STILL WATER
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAM 1246 -698 1 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: BLACK ALLEY SH Age: PERMIAN Interpretation Code:Yi09
Basal Information: Depth to Base:1307 Base Elevation: -759 Thickness: 26
Geologic Description: DK GY SH, OCCAS SILTY. GN FINELY MICAC CARB AND CALC IN PARTS
Reported Environment: ALTERNATING MARINE AND NON-MARINE. CARB MATERIAL SUGGESTS NON-MARINE TRAITION BETWEEN UNDERLYING MARINE PEAWADDY FM & NON-MARINE BANDANNA FM
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks PALYNOSTRATIGRAPHY: UPPER STAGE 5 (NORVICK, 1974)

STRATIGRAPHY: PEAWADDY FM Age: PERMIAN Interpretation Code:Yi10
Basal Information: Depth to Base:1336 Base Elevation: -788 Thickness: 29
Geologic Description: SSTS COLOURLESS TO LT GY,WITH M TO C GRAINS MINOR SH SLTST INTERCALATION. SHALES ARE DK GN AND CALC. SLTST GY TO GY GN. CONTAINS PRODUCTIDS
Reported Environment: OPEN MARINE SHORE ENVIRON OF DEPOSITION
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
MACRO FOSSILS 1320 -772 5 CA
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Yi11
Basal Information: Depth to Base:TD Base Elevation: -792 # Thickness:)4
Geologic Description: QUARTZ PORPHYRY
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT : WATER BORE 364

REFERENCE # A4 Y1
REFERENCE # A4 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Rot El	T.Dpth	status code
PRIVATE	WATER BORE	SF/55-1	20 50'50"S	144 11'40"E	+333	+333	-602	935	?

REFERENCE: X1 THIS REPORT Page Publn Year:

Cross Reference:

REFERENCE: Y1 VINE, R.R.
WATER BORE RECORD - BUREAU OF MINERAL RESOURCES
UNPUBLISHED (CARD INDEX) Page Publn Year:

Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:366 Base Elevation: -33 Thickness: 366
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:872 Base Elevation: -539 Thickness: 506
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:919 Base Elevation: -586 Thickness: 47
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:TD Base Elevation: -602 * Thickness: >16
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:175 Base Elevation: +158 Thickness: 175
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY-HUTTON Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:366 Base Elevation: -33 Thickness: 191
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED HOORAY SST TO HUTTON SST

STRATIGRAPHY: MOOLAYEMBER FM Age: TRIASSIC Interpretation Code:Y103
Basal Information: Depth to Base:549 Base Elevation: -216 Thickness: 183
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WARANG SST Age: TRIASSIC Interpretation Code:Y104
Basal Information: Depth to Base:872 Base Elevation: -539 Thickness: 323
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BETTS CREEK BEDS Age: PERMIAN Interpretation Code:Y105
Basal Information: Depth to Base:TD Base Elevation: -602 ± Thickness: >63
Geologic Description: COAL, SANDSTONE AND WHITE AND RED CONGLOMERATE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks VINE NOTES THAT LOWER 47 M OF CONGLOMERATE POSSIBLY RELATED TO BOONDEROO BEDS

CONTROL POINT: WESTBOURNE 1

REFERENCE # A48 Y1
REFERENCE # A48 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
AMERICAN O/S PET	RDH, CORE + WIRELINE	SG/55-6	25 11'27"S	146 08'02"E	+375	+380	-1103	1483	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
GERRARD, M.J.
AMERICAN OVERSEAS PETROLEUM LIMITED, WESTBOURNE NO 1, WELL COMPLETION REPORT
UNPUBLISHED COMPANY REPORT. BMR FILE 64/4027
Page Publn Year: 1964
Cross Reference: EXON, N.F. ET AL., 1972, BMR REPORT 143

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1005 Base Elevation: -626 Thickness: 1001
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1367 Base Elevation: -987 Thickness: 361
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1403 Base Elevation: -1023 Thickness: 36
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: CONFORMABLE CONTACT WITH TRIASSIC. BASAL ANGULAR UNCONFORMITY. REPRESENTS UNDIFF BANDANNA FM EQUIV & COLINLEA SST EQUIV

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:X105
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:TD Base Elevation: -1103* Thickness:)86
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: WALLUMBILLA FM Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:275 Base Elevation: +105 Thickness: 270
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks IN WILGUNYA SUB-GP OF ROLLING DOWNS GP. CALLED ROMA-TAMBO FM IN COMPLETION REPORT. PRESENT NOMENCLATURE-EXON ET AL. 1972

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:390 Base Elevation: -10 Thickness: 115
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INCLUDED IN BLYTHESDALE GP IN COMPLETION REPORT

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:503 Base Elevation: -123 Thickness: 113
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INJUNE CREEK GP. INCLUDED IN BLYTHESDALE GP IN COMPLETION REPORT

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:573 Base Elevation: -193 Thickness: 70
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INJUNE CREEK GP. INCLUDED IN BLYTHESDALE GP IN COMPLETION REPORT

STRATIGRAPHY: WALLOON GM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:684 Base Elevation: -304 Thickness: 111
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks INJUNE CREEK GP

STRATIGRAPHY: HUTTON-PRECIPICE Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1006 Base Elevation: -626 Thickness: 322

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: MIDDLEMERER FM EQUIV Age: TRIASSIC Interpretation Code:Y107
Basal Information: Depth to Base:1184 Base Elevation: -804 Thickness: 178
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CLEMATIS GP Age: TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:1367 Base Elevation: -987 Thickness: 183
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y109
Basal Information: Depth to Base:1403 Base Elevation: -1023 Thickness: 36
Geologic Description: INTBDD GY LAMD CARB SLTSTS, THINLY BDD BLK CLEAN HARD BITUMINOUS COAL, GY-BR CLAYSTONES, + OFF-WHITE F GR FAIRLY WELL SORTED QZOSE SST
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thickness
COAL	1377	997	3.5 CA
COAL	1382	-1002	2 CA
COAL	1393	-1013	1 CA

Tectonic Structure:
Remarks PALYNOLOGY SUGGESTS THIS UNIT EQUIV TO COLINLEA SST OR YOUNGER PERMIAN BEDS OF SPRINGSURE SHELF AREA

STRATIGRAPHY: UNDIFF PRE-PERMIAN Age: PRE-PERMIAN Interpretation Code:Y110
Basal Information: Depth to Base:TD Base Elevation: -1103+ Thickness: >611
Geologic Description: INDURATED SHALE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure: 40 DEGREE DIP. THICKNESS CORRECTED.
Remarks

CONTROL POINT: WESTON 1

REFERENCE # A9 Y1
REFERENCE # A8 Y2
REFERENCE # A8 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
HEMATITE PETROL.	RDH, CORE + WIRELINE	SF/54-12	22 02'20"S	142 36'39"E	+207	+211	-1772	1903	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference:

REFERENCE: Y1
WATSON, P.J.
WELL COMPLETION REPORT, WESTON NO. 1, QUEENSLAND, ATP 166P
UNPUBLISHED COMPANY REPORT. BMR FILE 74/221
Page Publn Year: 1974
Cross Reference:

REFERENCE: Y2
HAWKINS, P.J., AND GRAY, A.R.G.
REVIEW OF SUBSURFACE STRATIGRAPHIC DATA, NORTHERN GALILEE BASIN
GEOLOGICAL SURVEY OF QUEENSLAND RECORD 1981/3
Page Publn Year: 1981
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1248 Base Elevation: -1037 Thickness: 1244
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:1442 Base Elevation: -1231 Thickness: 194
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:1569 Base Elevation: -1358 Thickness: 127
Geologic Description: EIGHT COAL SEAMS. TOTAL OF 17.4 M; 14% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: UNCONFORMITY AT BASE. B'DARY CRITERIA: TOP AT FIRST MAJOR COAL, CHANGE IN LOGS

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:X104
Basal Information: Depth to Base:1793 Base Elevation: -1582 Thickness: 224
Geologic Description: TWENTY-THREE COAL SEAMS. TOTAL OF 50 M; 22.3% COAL
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks: B'DARY CRITERIA: TOP AT FIRST MAJOR COAL BELOW SAND AT BASE OF BANDANNA, BASE AT LOWERMOST COAL

STRATIGRAPHY: UNDIFF JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X185
Basal Information: Depth to Base:1964 Base Elevation: -1753 Thickness: 171
Geologic Description: TWO MINOR COAL SEAMS. TOTAL OF 2 M
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: JOE JOE GP Age: CARB-PERMIAN Interpretation Code:X106
Basal Information: Depth to Base:1964 Base Elevation: -1753 Thickness: 395
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS ARAMAC CM & UNDIFF JOE JOE GP

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X107
Basal Information: Depth to Base:TD Base Elevation: -1772 Thickness: >19
Geologic Description: PHYLLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:972 Base Elevation: -761 Thickness: 968
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CONTAINS WINTON + MACKUNDA FMS, ALLARU MDST, TOOLEBUC LST, WALLUMBILLA FM

STRATIGRAPHY: HOORAY SST Age: JURASSIC-CRET Interpretation Code:Y102
Basal Information: Depth to Base:1136 Base Elevation: -925 Thickness: 164
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1166 Base Elevation: -955 Thickness: 30
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1248 Base Elevation: -1037 Thickness: 82
Geologic Description:
Reported Environment:
Interpreted Environment:

Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1442 Base Elevation: -1231 Thickness: 194
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF PERMIAN Age: PERMIAN Interpretation Code:Y106
Basal Information: Depth to Base:1964 Base Elevation: -1753 Thickness: 522
Geologic Description: INTBDD BLACK COAL, M WEAKLY CONSOL CARBONACEOUS SST, F GR WELL CONSOL SST, MINOR DK GY SHALE, + SPECKLED CARB SLTST. FINELY INTERLMAINATED
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL SEAMS T'OUT 1792 -1581 358
COAL INTERVAL: 2 CMS 1918 -1707 10
Tectonic Structure:
Remarks PALYNOLOGICAL DATE - STAGE 2-3 TOWARDS BASE, STAGE 5 AT TOP

STRATIGRAPHY: BASEMENT Age: PRE-PERMIAN Interpretation Code:Y107
Basal Information: Depth to Base:TD Base Elevation: -1772* Thickness: 719
Geologic Description:
Reported Environment
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: [illegible] SEQ. Age: JURASSIC-CRET Interpretation Code:Y201
Basal Information: Depth to Base:1266 Base Elevation: -1055 Thickness: 1262
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:Y202
Basal Information: Depth to Base:1442 Base Elevation: -1231 Thickness: 176
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA-COLINLEA Age: PERMIAN Interpretation Code:Y203
Basal Information: Depth to Base:1568 Base Elevation: -1357 Thickness: 126
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks REPRESENTS UNDIFFERENTIATED BANDANNA FM EQUIV. AND COLINLEA SST EQUIV.

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:Y284
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * BANDANNA FM EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA" ENTRY

STRATIGRAPHY: COLINLEA SST EQUIV Age: PERMIAN Interpretation Code:Y285
Basal Information: Depth to Base:* Base Elevation: * Thickness: *
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks * COLINLEA SST EQUIV NOT DIFFERENTIATED IN THIS INTERP. SEE "BANDANNA-COLINLEA " ENTRY

STRATIGRAPHY: ARAMAC CM Age: PERMIAN Interpretation Code:Y286
Basal Information: Depth to Base:1793 Base Elevation: -1582 Thickness: 225
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF UPPER CARB Age: CARBONIFEROUS Interpretation Code:Y287
Basal Information: Depth to Base:1964 Base Elevation: -1753 Thickness: 171
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:Y288
Basal Information: Depth to Base:TD Base Elevation: -1772* Thickness: 919
Geologic Description: PHYLLITE
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

CONTROL POINT: YONGALA 1

REFERENCE # A66 Y1
REFERENCE # A66 X1

Organisation	Type	Mapno	Lat	Long	Surf El	Ref El	Bot El	T.Dpth	status code
ALLIANCE OIL DEV	RDH, CORE + WIRELINE	SG/54-8	25 30'19"S	143 55'48"E	+204	+208	-2901	3109	?

REFERENCE: X1
THIS REPORT
Page Publn Year:
Cross Reference: NORVICK, M., 1974, BUR. MIN. RES. RECORD 1974/141

REFERENCE: Y1 LAING, A.C.M.
WELL COMPLETION REPORT, ALLIANCE YONGALA NO.1 WELL, A.P.98P, QUEENSLAND
ALLIANCE OIL DEVELOPMENT AUST. N.L. UNPUBL. REPT. BMR FILE 65/4150 Page Publn Year: 1966
Cross Reference:

SEDIMENTARY BASIN: GALILEE

STRATIGRAPHY: EROMANGA BASIN SEQ. Age: JURASSIC-CRET Interpretation Code:X101
Basal Information: Depth to Base:1992 Base Elevation: -1784 Thickness: 1988
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: UNDIFF TRIASSIC Age: TRIASSIC Interpretation Code:X102
Basal Information: Depth to Base:2063 Base Elevation: -1855 Thickness: 71
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BANDANNA FM EQUIV Age: PERMIAN Interpretation Code:X103
Basal Information: Depth to Base:2097 Base Elevation: -1889 Thickness: 34
Geologic Description: F-M POROUS POORLY SRTD ANG QZ SST NEAR BASE, BLK BRITTLE COAL, DK GY SILTY SANDY CARB SHALE WITH PLANT REMAINS (LAING, 1966)
Reported Environment:
Interpreted Environment:
Geologic Features:

Feature	Depth	Elevation	Thick. s
COAL INTERVAL	2087	-1879	16

Tectonic Structure:
Remarks IDENTIFICATION UNCERTAIN. PALYNOSTRATIGRAPHY: ?STAGE 5 (AT 2084 M) (NORVICK, 1974)

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:X104
Basal Information: Depth to Base:2733 Base Elevation: -2525 Thickness: 638
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:X105
Basal Information: Depth to Base:3014 Base Elevation: -2806 Thickness: 281
Geologic Description:
Reported Environment:

Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
SHALE/SILTSTONE MB 2940 -2732 207
SANDSTONE MEMBER 3014 -2806 74
Tectonic Structure:
Remarks

STRATIGRAPHY: COOLADDI DOLOMITE Age: DEVONIAN Interpretation Code:X106
Basal Information: Depth to Base:3031 Base Elevation: -2823 Thickness: 17
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: LISSOY SST Age: DEVONIAN Interpretation Code:X107
Basal Information: Depth to Base:3050 Base Elevation: -2842 Thickness: 19
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: CUMBARDO FM Age: DEVONIAN Interpretation Code:X108
Basal Information: Depth to Base:3071 Base Elevation: -2863 Thickness: 21
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ? Interpretation Code:X109
Basal Information: Depth to Base:TD Base Elevation: -2901± Thickness: >38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ROLLING DOWNS GP Age: CRETACEOUS Interpretation Code:Y101
Basal Information: Depth to Base:1302 Base Elevation: -1094 Thickness: 1293
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: HOORAY SST Age: JURASSIC Interpretation Code:Y102
Basal Information: Depth to Base:1567 Base Elevation: -1359 Thickness: 265
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED UNITS A-G OF YONGALA GROUP IN W.C.R.

STRATIGRAPHY: WESTBOURNE FM Age: JURASSIC Interpretation Code:Y103
Basal Information: Depth to Base:1624 Base Elevation: -1416 Thickness: 57
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED H FORMATION OF YONGALA GP IN W.C.R.

STRATIGRAPHY: ADORI SST Age: JURASSIC Interpretation Code:Y104
Basal Information: Depth to Base:1653 Base Elevation: -1445 Thickness: 29
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED I SANDSTONE OF YONGALA GP IN W.C.R.

STRATIGRAPHY: BIRKHEAD FM Age: JURASSIC Interpretation Code:Y105
Basal Information: Depth to Base:1725 Base Elevation: -1517 Thickness: 72
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED J SHALE OF YONGALA GP IN W.C.R.

STRATIGRAPHY: HUTTON SST Age: JURASSIC Interpretation Code:Y106
Basal Information: Depth to Base:1904 Base Elevation: -1696 Thickness: 179
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED K SANDSTONE OF YONGALA GP IN W.C.R.

STRATIGRAPHY: EVERGREEN FM Age: JURASSIC Interpretation Code:Y137
Basal Information: Depth to Base:1927 Base Elevation: -1719 Thickness: 23
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks CALLED L FORMATION OF YONGALA GP IN W.C.R.

STRATIGRAPHY: UNDIFF PERMO-TRIAS Age: PERMO-TRIASSIC Interpretation Code:Y108
Basal Information: Depth to Base:2095 Base Elevation: -1887 Thickness: 168
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
COAL 2072 -1864 1
COAL 2081 -1873 3.1
COAL 2087 -1879 4.6
Tectonic Structure:
Remarks UNCONFORMITY AT BASL

STRATIGRAPHY: BUCKABIE FM Age: DEVONIAN-CARB Interpretation Code:Y109
Basal Information: Depth to Base:2735 Base Elevation: -2527 Thickness: 640

Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: ETONVALE FM Age: DEVONIAN Interpretation Code:Y110
Basal Information: Depth to Base:3045 Base Elevation: -2837 Thickness: 310
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: GUMBARDO FM Age: DEVONIAN Interpretation Code:Y111
Basal Information: Depth to Base:3071 Base Elevation: -2863 Thickness: 26
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

STRATIGRAPHY: BASEMENT Age: ORDOVICIAN? Interpretation Code:Y112
Basal Information: Depth to Base:TD Base Elevation: -2901* Thickness: 38
Geologic Description:
Reported Environment:
Interpreted Environment:
Geologic Features: Feature Depth Elevation Thickness
Tectonic Structure:
Remarks

COAL ANALYSES

BAERAMI CREEK DDH 1 Basin: GUNNEDAH Lat and Long: 32 28'33"S 150 29'19"E
G44

Depth:146.90 Thickness: 1.67 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 4.8	Ash:25.9	VM: 27.1	FC: 42.2	0.48				

Remarks: SM 4. EXCLUDES ASH >30%. DAF VM IS 39.1%

Depth:190.23 Thickness: 1.91 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 4.8	Ash:11.8	VM: 34.4	FC: 49.0	0.52				

Remarks: SM 6. EXCLUDES ASH >30%. DAF VM IS 41.2%

Depth:314.79 Thickness: 0.81 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 3.2	Ash:18.0	VM: 27.5	FC: 51.3	0.83				

Remarks: SM 15. DAF VM IS 34.9%

Depth:332.28 Thickness: 1.87 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 3.4	Ash:21.2	VM: 22.7	FC: 52.7	0.38				

Remarks: SM 16. EXCLUDES ASH >30%. DAF VM IS 30.1%

Depth:392.31 Thickness: 3.34 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.9	Ash:16.3	VM: 21.4	FC: 59.4	0.53				

Remarks: SM 19, BAYSWATER SM. EXCLUDES ASH >30%. DAF VM IS 26.5

Depth:443.11 Thickness: 1.43 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.6	Ash:23.3	VM: 30.6	FC: 42.5	0.49				

Remarks: SM 21. EXCLUDES ASH >30%. DAF VM IS 41.9%

BAERAMI CREEK DDH 2 Basin: GUNNEDAH Lat and Long: 32 33'39"S 150 26'12"E
G43

Depth:293 Thickness: 4.84 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.6	Ash:15.2	VM: 27.1	FC: 55.1					

Remarks: SM 18. BAYSWATER SM. EXCLUDES ASH >30%. DAF VM IS 33.0%

BEDFORD CREEK BORE Basin: SYDNEY, WEST Lat and Long: 33 47'29"S 150 28'11"E
S76 Y1

Depth:227 Thickness: 0.2 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash: 9.4	VM: 26.4	FC: 62.6					

Remarks: KATOOMBA SEAM. D.A.F. VM=29.7%

Depth:227 Thickness: 0.25 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash: 8.2	VM: 29.5	FC: 60.7					

Remarks: KATOOMBA SEAM. D.A.F. VM=32.7%

Depth:227 Thickness: 0.15 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.7	Ash: 8.1	VM: 30.8 FC: 59.4					

Remarks: KATOOMBA SEAM. D.A.F. VM=34.1%

Depth:227 Thickness: 0.2 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.8	Ash: 9.1	VM: 28.5 FC: 60.6					

Remarks: KATOOMBA SEAM. D.A.F. VM=32.0%

Depth:227 Thickness: 0.4 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash: 9.1	VM: 30.5 FC: 58.8					

Remarks: KATOOMBA SEAM. D.A.F. VM=34.2%

Depth:227 Thickness: 0.15 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash:35.9	VM: 21.0 FC: 41.5					

Remarks: KATOOMBA SEAM. D.A.F. VM=33.6%

Depth:227 Thickness: 1.4 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash:12.3	VM: 28.1 FC: 58.0					

Remarks: KATOOMBA SEAM. D.A.F. VM=32.6%

BLACKWATER NS 212 Basin: BOWEN, CENTRAL Lat and Long: 23 33'37"S 148 51'22"E
B91

Depth:160 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash:16.5	VM:	FC:				

Remarks: DAF VOLATILE MATTER IS 26.0%

Depth:221 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash:22.4	VM:	FC:				

Remarks: DAF VOLATILE MATTER IS 25.4%

BLACKWATER NS 9 Basin: BOWEN, CENTRAL Lat and Long: 23 21'52"S 148 53'00"E
B77

Depth:65 Thickness: %Rec: #Sms 1 Sample Type:WC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash:16.2	VM:	FC:	0.36	0.11		

Remarks: MAMMOTH SM. RC HAS 20.6% ASH, 24.3% VM (DAF).

Depth:131 Thickness: %Rec: #Sms 1 Sample Type:WC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash:13.2	VM:	FC:	0.25	0.03		

Remarks: POLLUX SM. RC ANALYSIS HAS 15.6% ASH, 23.4% VM (DAF).

Depth:150 Thickness: %Rec: #Sms 1 Sample Type:WC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash:16.0	VM: FC:	0.30				

Remarks: PICES SM. RC HAS 20.0% ASH, 22.5% VM (DAF).

BORE 32 (WOLLONGONG) Basin: SYDNEY, SOUTH Lat and Long: 34 15'18"S 150 36'25"E
S101

Depth:416 Thickness: 2.1 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.4	Ash:10.2	VM: 62.4 FC: 26.0					

Remarks: BULLI SEAM, A. COMPOSITE ANALYSIS

Depth:416 Thickness: 2.1 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.4	Ash:10.0	VM: 62.6 FC: 26.0					

Remarks: BULLI SEAM, A. COMPOSITE ANALYSIS, EXLUDING ASH >40%

Depth:423 Thickness: 1.1 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash:27.9	VM: 50.4 FC: 20.4					

Remarks: BALGOWNIE SEAM, A. COMPOSITE ANALYSIS

Depth:423 Thickness: 0.8 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5	Ash:22.7	VM: 54.9 FC: 20.9					

Remarks: BALGOWNIE SEAM, B. COMPOSITE ANALYSIS

Depth:423 Thickness: 0.8 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5 Ash:21.1 VM: 56.1 FC: 21.2					

Remarks: BALGOWNIE SEAM, B. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:446 Thickness: 2.5 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.4 Ash:28.8 VM: 47.7 FC: 22.1					

Remarks: WONGAWILLI SEAM, O. COMPOSITE ANALYSIS

Depth:446 Thickness: 2.2 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:21.7 VM: 54.2 FC: 22.9					

Remarks: WONGAWILLI SEAM, O. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:446 Thickness: 1.9 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:19.3 VM: 56.0 FC: 23.5					

Remarks: WONGAWILLI SEAM, O. COMPOSITE ANALYSIS, EXCLUDING ASH >30%

Depth:489 Thickness: 1.9 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.1 Ash:39.7 VM: 37.9 FC: 20.3					

Remarks: TONGARRA SEAM, A. COMPOSITE ANALYSIS

Depth:489 Thickness: 1.4 %Rec: #Sms Sample Type:CHP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5 Ash:19.1 VM: 24.9 FC: 54.5						

Remarks: TONGARRA SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:489 Thickness: 1.3 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5 Ash:18.2 VM: 54.9 FC: 25.4						

Remarks: TONGARRA SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >30%

BORE 37 (WOLLONGONG) Basin: SYDNEY, SOUTH Lat and Long: 34 17'18"S 150 45'56"E
S100

Depth:439 Thickness: 2.4 %Rec: #Sms Sample Type:CHP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:12.6 VM: 65.9 FC: 20.3						

Remarks: BULLI SEAM, B-K. COMPOSITE ANALYSIS

Depth:447 Thickness: 0.8 %Rec: #Sms Sample Type:CHP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash:16.5 VM: 62.1 FC: 20.3						

Remarks: BALGOWNIE SEAM, A-F.COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:478 Thickness: 2.0 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash:18.7 VM: 19.5 FC: 60.7						

Remarks: WONGAWILLI SM, G-W. COMPOS. ANALYSIS EXCL. ASH >40%. TOTAL ASH = 25.2%

Depth:526 Thickness: 1.3 %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Eppm	Other
V%:	%:	I%:	Moist: 0.8 Ash:23.6 VM: 56.4 FC: 19.2					

Remarks: TONGARRA SEAM, G-R. COMPOS. ANALYSIS EXCL. ASH >40%. TOTAL ASH = 37.9%

BORE 5 (WOLLONGONG) Basin: SYDNEY, SOUTH Lat and Long: 34 21'48"S 150 30'22"E
S102Y1

Depth:A Thickness: 2.1 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.0 Ash:20.0 VM: 21.0 FC: 57.0					

Remarks: UNSPECIFIED DEPTH - BALGOWNIE SM. COMPOSITE ANALYSIS

Depth:A Thickness: 2.0 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.0 Ash:17.9 VM: 21.3 FC: 58.8					

Remarks: UNSPECIFIED DEPTH - BALGOWNIE SM. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:A Thickness: 1.9 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.0 Ash:16.6 VM: 21.3 FC: 60.1					

Remarks: UNSPECIFIED DEPTH - BALGOWNIE SM. COMPOSITE ANALYSIS, EXCLUDING ASH >30%

Depth:J Thickness: 2.6 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.5 Ash:26.0 VM: 21.7 FC: 49.8					

Remarks: UNSPECIFIED DEPTH - WONGAWILLI SEAM. COMPOSITE ANALYSIS

Depth:J Thickness: 2.3 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.3 Ash:21.0 VM: 22.6 FC: 54.1					

Remarks: UNSPECIFIED DEPTH - WONGAWILLI SM. COMPOSITE ANALYSIS, EXCL. ASH >40%

Depth: Thickness: 0.2 %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.9 Ash:19.8 VM: 22.5 FC: 55.8					

Remarks: UNSPECIFIED DEPTH - BULLI SEAM

Depth:J Thickness: 2.1 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.3 Ash:19.5 VM: 23.1 FC: 55.1					

Remarks: UNSPECIFIED DEPTH - WONGAWILLI SM. COMPOSITE ANALYSIS, EXCL. ASH >30%

BORE 72 (CAMDEN) Basin: SYDNEY, SOUTH Lat and Long: 34 05'47"S 150 52'27"E
S94

Depth:616 Thickness: 1.3 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.9 Ash:11.9 VM: 18.1 FC: 69.1					

Remarks: BULLI SEAM, B. COMPOSITE ANALYSIS, EXCLUDING ASH >30%

Depth:616 Thickness: 1.7 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.0 Ash:19.5 VM: 17.7 FC: 61.8					

Remarks: BULLI SEAM, A. COMPOSITE ANALYSIS

Depth:616 Thickness: 1.3 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 0.9 Ash:12.4 VM: 18.4 FC: 68.3					

Remarks: BULLI SEAM, B. COMPOSITE ANALYSIS

Depth:646 Thickness: 0.9 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.3 Ash:18.8 VM: 20.2 FC: 59.7					

Remarks: BALGOWNIE SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:646 Thickness: 0.7 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.3 Ash:13.8 VM: 21.2 FC: 63.7					

Remarks: BALGOWNIE SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >30%

Depth:646 Thickness: 1.2 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.4 Ash:23.9 VM: 19.8 FC: 55.9					

Remarks: BALGOWNIE SEAM, A. COMPOSITE ANALYSIS

Depth:728 Thickness: 0.6 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.7 Ash:24.6 VM: 14.6 FC: 59.1					

Remarks: WONGAWILLI SEAM, A. COMPOSITE ANALYSIS, EXLUDING ASH >30%

Depth:728 Thickness: 1.4 %Rec: #Sms Sample Type:CHP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.8 Ash:31.1 VM: 13.1 FC: 54.0					

Remarks: WONGAWILLI SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:728 Thickness: 3.4 %Rec: #Sms Sample Type:CHP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.6 Ash:52.7 VM: 10.4 FC: 34.3					

Remarks: WONGAWILLI SEAM, A. COMPOSITE ANALYSIS

BORE 75 (CAMDEN) Basin: SYDNEY, SOUTH Lat and Long: 34 05'32"S 150 59'14"E
S96

Depth:545 Thickness: 0.8 %Rec: #Sms Sample Type:CHP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.3 Ash:58.5 VM: 11.9 FC: 28.3					

Remarks: BULLI SEAM, A. COMPOSITE ANALYSIS

Depth:545 Thickness: 0.3 %Rec: #Sms Sample Type:CHP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.1 Ash:31.5 VM: 16.1 FC: 51.3					

Remarks: BULLI SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH > 40%

Depth:545 Thickness: 0.08 %Rec: #Sms Sample Type:CHP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.0 Ash:17.1 VM: 15.8 FC: 66.1					

Remarks: BULLI SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >30%

Depth:568 Thickness: 1.7 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:16.2 VM: 19.5 FC: 63.1					

Remarks: BALGOWNIE SEAM, A. COMPOSITE ANALYSIS

Depth:568 Thickness: 1.6 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:14.9 VM: 19.7 FC: 64.2					

Remarks: BALGOWNIE SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

Depth:749 Thickness: 0.6 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3 Ash:49.6 VM: 11.2 FC: 37.9					

Remarks: TONGARRA SEAM, A. COMPOSITE ANALYSIS

Depth:749 Thickness: 0.4 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6 Ash:25.9 VM: 14.3 FC: 58.2					

Remarks: TONGARRA SEAM, A. COMPOSITE ANALYSIS, EXCLUDING ASH >40%

BORE 81 (WOLLONGONG) Basin: SYDNEY, SOUTH Lat and Long: 34 24'03"S 150 38'17"E
S104Y1

Depth:A Thickness: 0.9 %Rec: #Sms Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.9 Ash:42.1 VM: 3.5 FC: 50.5					

Remarks: UNSPECIFIED DEPTH - BULLI SEAM, COMPOSITE ANALYSIS

Depth:A Thickness: 0.7 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 4.5 Ash:30.2 VM: 3.2 FC: 62.1					

Remarks: UNSPECIFIED DEPTH - BULLI SM. COMPOSITE ANALYSIS, EXCLUDING ASH OVER 40%

Depth:A Thickness: 0.2 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 5.5 Ash:21.5 VM: 2.5 FC: 70.5					

Remarks: UNSPECIFIED DEPTH - BULLI SM. COMPOSITE ANALYSIS, EXCLUDING ASH OVER 30%

Depth:D Thickness: 3.1 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.6 Ash:31.2 VM: 21.7 FC: 45.5					

Remarks: UNSPECIFIED DEPTH - WONGAWILLI SEAM. COMPOSITE ANALYSIS

Depth:D Thickness: 2.7 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.5 Ash:23.4 VM: 23.0 FC: 52.1					

Remarks: UNSPEC. DEPTH - WONGAWILLI SM. COMPOSITE ANALYSIS, EXCL. ASH OVER 40%

Depth:D Thickness: 2.3 %Rec: #Sms Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.5 Ash:21.7 VM: 23.4 FC: 53.4					

Remarks: UNSPEC. DEPTH - WONGAWILLI SM. COMPOSITE ANALYSIS, EXCL. ASH OVER 30%

BUCKLAND NS 1
B127

Basin: BOWEN, SOUTH-WEST Lat and Long: 24 39'24"S 147 42'14"E

Depth:20 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:14.60 Ash: 6.00 VM: 31.60 FC: 47.80	3.50				

Remarks:

BYLONG DDH 1
G38

Basin: GUNNEDAH Lat and Long: 32 32'00"S 150 01'10"E

Depth:44 Thickness: 2 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 5.5 Ash:16.9 VM: 29.2 FC: 48.4	0.44				

Remarks: COMPOSITE ANALYSIS OF SM 2 EXCLUDING ASH OVER 30%. DAF VM IS 37.6%

Depth:49.53 Thickness: 2.02 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 4.9 Ash:19.8 VM: 31.0 FC: 44.3	0.50				

Remarks: COMPOSITE ANALYSIS OF PART OF SM 3 EXCLUDING ASH >30%. DAF VM IS 41.2%

BYLONG DDH 3
G36

Basin: GUNNEDAH Lat and Long: 32 21'37"S 150 06'10"E

Depth:104 Thickness: 3 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.9 Ash:11.8 VM: 33.3 FC: 52.0					

Remarks: BAYSWATER SM. DAF VM IS 39.0%

Depth:109.43 Thickness: 0.36 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 4.0 Ash:18.8 VM: 37.6 FC: 39.6					

Remarks: SM 10. ANALYSIS OF SAMPLE FROM TOP OF SM. DAF VM IS 48.7%

CAIRNS COUNTY NS 10 Basin: BOWEN, NORTH Lat and Long: 22 21'02"S 148 19'02"E
B46

Depth:386 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.8 Ash:13.0 VM: 13.8 FC: 72.4	0.27				

Remarks:

Depth:217 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.8 Ash: 8.2 VM: 17.0 FC: 74.0	1.00	0.047			

Remarks:

Depth:285 Thickness: %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.8 Ash:11.6 VM: 14.0 FC: 73.6	0.38				

Remarks:

Depth:387 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.8 Ash:11.7 VM: 13.3 FC: 74.2	0.44				

Remarks:

Depth:388 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.7 Ash:10.0 VM: 13.7	FC: 75.6	0.27				

Remarks:

Depth:389 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.7 Ash:10.7 VM: 14.3	FC: 74.3	0.33				

Remarks:

Depth:390 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.8 Ash: 6.4 VM: 14.7	FC: 78.	0.36				

Remarks:

CAIRNS COUNTY NS 11 Basin: BOWEN, NORTH Lat and Long: 22 20'02"S 148 20'46"E
B44

Depth:174 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.1 Ash:15.9 VM: 21.3	FC: 60.7	0.39				

Remarks:

Depth:175 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.2 Ash:13.6 VM: 19.7	FC: 64.5	0.29				

Remarks:

Depth:176 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.9	Ash:12.4	VM: 20.5	FC: 65.2	0.33				

Remarks:

Depth:178 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.8	Ash:15.2	VM: 21.1	FC: 61.9	0.33				

Remarks:

Depth:197 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.0	Ash:15.6	VM: 18.9	FC: 63.5	0.29				

Remarks:

Depth:198 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.9	Ash:15.2	VM: 20.1	FC: 62.8	0.31				

Remarks:

Depth:199 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.1	Ash:14.1	VM: 19.9	FC: 63.9	0.27				

Remarks:

CAIRNS COUNTY NS 13 Basin: BOWEN, NORTH Lat and Long: 22 09'03"S 148 09'29"E
B39

Depth:314 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash:12.3	VM: 19.8 FC: 66.3	0.47	0.014			

Remarks:

Depth:316 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash:10.3	VM: 19.3 FC: 68.8	0.43	0.033			

Remarks:

Depth:317 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash:11.1	VM: 19.3 FC: 68.0	0.46	0.042			

Remarks:

Depth:358 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5	Ash:14.8	VM: 17.5 FC: [illegible]	0.44	0.109			

Remarks:

Depth:360 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5	Ash:10.1	VM: 18.3 FC: 70.1	0.49	0.178			

Remarks:

Depth:361 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash: 7.5	VM: 18.9	FC: 72.3	0.49	0.143			

Remarks:

CAIRNS COUNTY NS 67 Basin: BOWEN, NORTH Lat and Long: 22 40'32"S 148 30'27"E
B52

Depth:285 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash:13.9	VM: 13.6	FC: 71.2	1.00				

Remarks:

Depth:362 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2	Ash:11.2	VM: 13.1	FC: 74.5	0.95	0.069			

Remarks:

Depth:363 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2	Ash:12.7	VM: 12.7	FC: 73.4	0.67				

Remarks:

Depth:434 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.4	Ash: 9.1	VM: 11.9	FC: 77.6	0.53	0.061			

Remarks:

Depth:436 Thickness: %Rec: #Sms 1 Sample Type:RG

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash: 9.8	VM: 12.1	FC: 76.8	0.52	0.045			

Remarks:

Depth:301 Thickness: %Rec: #Sms 1 Sample Type:RG

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash:11.6	VM: 13.9	FC: 73.2	0.67				

Remarks:

CAIRNS COUNTY NS 69 Basin: BOWEN, NORTH Lat and Long: 22 30'05"S 148 23'09"E
B49

Depth:270 Thickness: %Rec: #Sms 1 Sample Type:RG

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2	Ash: 9.8	VM: 17.4	FC: 71.6	0.66	0.132			

Remarks:

Depth:293 Thickness: %Rec: #Sms 1 Sample Type:RG

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2	Ash:17.5	VM: 15.5	FC: 65.8	0.97				

Remarks:

Depth:302 Thickness: %Rec: #Sms 1 Sample Type:RG

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2	Ash: 7.7	VM: 17.3	FC: 73.8	0.60	0.071			

Remarks:

Depth:338 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash: 8.3 VM: 15.4 FC: 75.5		0.58	0.069			

Remarks:

Depth:341 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash: 8.6 VM: 15.4 FC: 74.9		0.56	0.074			

Remarks:

Depth:342 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash: 6.9 VM: 15.6 FC: 76.4		0.53	0.035			

Remarks:

Depth:354 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash: 9.4 VM: 15.1 FC: 74.3		0.53	0.002			

Remarks:

Depth:361 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash:10.7 VM: 15.2 FC: 73.0		0.50	0.003			

Remarks:

Depth:380 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.0 Ash: 6.9 VM: 15.5 FC: 76.6		0.53	0.046			

Remarks:

CAIRNS COUNTY NS 7 Basin: BOWEN, NORTH Lat and Long: 22 21'53"S 148 18'25"E
B47

Depth:55 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5 Ash: 7.9 VM: 19.7 FC: 70.9		1.68				

Remarks:

Depth:222.4 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash:10.4 VM: 15.4 FC: 73.1		0.56				

Remarks:

Depth:223.6 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:10.7 VM: 15.3 FC: 72.8		0.53				

Remarks:

Depth:224 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.0 Ash:10.6 VM: 15.2 FC: 73.2		0.52				

Remarks:

Depth:225 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1	Ash: 9.0	VM: 14.5 FC: 75.4	0.51				

Remarks:

Depth:226 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.0	Ash: 6.3	VM: 16.1 FC: 76.6	0.52				

Remarks:

Depth:227 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.0	Ash: 9.3	VM: 15.9 FC: 73.8	0.52				

Remarks:

Depth:228 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.0	Ash: 5.8	VM: 15.8 FC: 77.4	0.54				

Remarks:

CAIRNS COUNTY NS 95 Basin: BOWEN, NORTH Lat and Long: 22 13'15"S 148 18'07"E
343

Depth:50 Thickness: 3.7 %Rec: 100 #Sms 1 Sample Type:FLOATS

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.1	Ash:11.5	VM: 20.5 FC: 65.9	0.27	0.206			

Remarks: COMPOSITE ANALYSIS FOR LEICHHARDT SM

Depth:77 Thickness: 2.5 %Rec: 100 #Sms 1 Sample Type:FLOATS

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.2	Ash:17.8	VM: 20.8	FC: 59.2	0.37	0.010			

Remarks: VERMONT SM

CONSUELO NS 2
B131

Basin: BOWEN, SOUTH-WEST Lat and Long: 24 57'48"S 148 20'11"E

Depth:106 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.60	Ash:12.50	VM: 27.80	FC: 49.10	0.33				

Remarks:

Depth:130 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:13.30	Ash:5.80	VM: 30.50	FC: 50.40					

Remarks:

Depth:131 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:11.10	Ash:26.20	VM: 26.20	FC: 52.90	0.27				

Remarks:

DENISON NS 1
B111

Basin: BOWEN, SOUTH-WEST Lat and Long: 24 14'20"S 148 29'20"E

Depth:96 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.70	Ash:10.70	VM: 32.10	FC: 46.30	0.38	0.01			

Remarks:

Depth:98 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.00	Ash:10.80	VM: 28.30	FC: 50.90	0.48	0.17			

Remarks:

Depth:99 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.50	Ash: 6.80	VM: 29.00	FC: 53.00	0.44	0.04			

Remarks:

Depth:119 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:11.40	Ash:11.80	VM: 28.10	FC: 48.70	0.36	0.04			

Remarks:

DENISON NS 18 B96 — Basin: BOWEN, SOUTH-WEST — Lat and Long: 23 50'33"S 148 18'32"E

Depth:290 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 7.3	Ash:13.3	VM: 27.2	FC: 52.2	0.28				

Remarks: DAF VOLATILE MATTER IS 34.26%

DENISON NS 28 B106 — Basin: BOWEN, SOUTH-WEST — Lat and Long: 24 06'45"S 148 24'33"E

Depth:232 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:12.10	Ash:10.80	VM: 26.80	FC: 50.30	0.24	0.10			

Remarks: DAF VOLATILE MATTER IS 37.69%

Depth:247 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:12.20	Ash:16.80	VM: 25.00	FC: 46.00	0.26	0.10			

Remarks: DAF VOLATILE MATTER IS 35.21%

DENISON NS 53 B88 — Basin: BOWEN, CENTRAL — Lat and Long: 23 37'27"S 148 24'34"E

Depth:162.72 Thickness: 1.76 %Rec: #Sms1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 6.6	Ash: 9.2	VM: 29.2	FC: 55.5	0.32	0.035			

Remarks: ARIES II SM. DAF VM IS 34.6%

DENISON NS33/38R/39R B82 Basin: BOWEN, SOUTH-WEST Lat and Long: 23 28'16"S 148 08'46"E

Depth:486 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:10.8	Ash:11.1	VM: 27.6	FC: 50.5	0.18	0.02			

Remarks: DAF VOLATILE MATTER IS 35.34%

Depth:487 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:12.1	Ash:10.7	VM: 33.5	FC: 43.7	0.18	0.02			

Remarks: DAF VOLATILE MATTER IS 43.39%

Depth:514 Thickness: %Rec: #3ms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 7.9	Ash:15.5	VM: 32.3	FC: 44.3	0.38				

Remarks: DAF VOLATILE MATTER IS 42.17%

DENMAN DDH 1 G48 Basin: GUNNEDAH Lat and Long: 32 16'05"S 150 43'43"E

Depth:170.95 Thickness: 3.90 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 6.6	Ash: 8.2	VM: 49.5	FC: 35.7					

Remarks: SEAM 8. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 41.9%

DMC BD1 Basin: BOWEN, NORTH: WOLFANG Lat and Long: 22 43'53"S 147 37'51"E
B54

Depth:210 Thickness: %Rec: #Sms 1 Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash: 5.9	VM: 29.0	FC: 65.1	0.29				

Remarks: DAF VM IS 30.3%. REFERENCE: COOK ANT TAYLOR, 1979

DOYLES CREEK DDH 10 Basin: GUNNEDAH Lat and Long: 32 16'21"S 150 38'08"E
G47

Depth: 99.26 Thickness: 2.93 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	6.2	Ash:16.0	VM: 53.6	FC: 24.2				

Remarks: CALCULATED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 31.1%. SEAM 1

Depth:109.39 Thickness: 3.86 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	5.1	Ash:16.8	VM: 50.7	FC: 27.4				

Remarks: SEAM 2. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 35.1%.

Depth:380.82 Thickness: 2.0 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	5.0	Ash:27.4	VM: 39.3	FC: 28.2				

Remarks: SEAM 9. DETERMINED ANALYSIS DAF VM IS 41.8%.

Depth:425.14 Thickness: 3.44 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.8 Ash:11.7 VM: 50.9 FC: 33.6					

Remarks: SEAM 10. DETERMINED ANALYSIS DAF VM IS 39.8%.

Depth:519.80 Thickness: 2.03 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.1 Ash:10.5 VM: 55.3 FC: 31.1					

Remarks: SEAM 16. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 36.0%.

Depth:609.08 Thickness: 2.16 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.1 Ash:13.1 VM: 53.9 FC: 29.9					

Remarks: SEAM 19. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 35.7%.

Depth:639.15 Thickness: 1.98 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.7 Ash:11.5 VM: 52.8 FC: 33.0					

Remarks: SEAM 22. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 38.5%.

Depth:647.70 Thickness: 1.57 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.1 Ash: 9.9 VM: 54.4 FC: 32.6					

Remarks: SEAM 23. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 37.5%.

Depth:706.62 Thickness: 1.87 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.8	Ash: 9.8	VM: 55.8	FC: 31.6					

Remarks: SEAM 24. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 36.2%.

Depth:733.36 Thickness: 9.36 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.7	Ash:16.2	VM: 54.6	FC: 26.5					

Remarks: BAYSWATER SM 25. DETERMINED ANAL. EXCLUD. ASH >30%. DAF VM IS 32.7%

DOYLES CREEK DDH 11 Basin: SYDNEY, NORTH Lat and Long: 32 41'51"S 151 00'27"E
S24

Deprh:93 Thickness: 2.5 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:3.7	Ash:15.8	VM: 27.5	FC: 49.0					

Remarks: SM 2

Depth:117 Thickness: 1.4 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:4.2	Ash:11.2	VM: 29.4	FC: 55.2					

Remarks: SM 4

Depth:101 Thickness: 1.5 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:4.1	Ash:27.7	VM: 23.3	FC: 44.9					

Remarks: SM 3

Depth:225 Thickness: 2.6 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	C: I%:		Moist:3.0 Ash:15.3 VM: 31.9 FC: 49.8					

Remarks: SM 13 COMPOSITE ANALYSIS EXCLUDING ASH OVER 30%

Depth:438 Thickness: 2.1 %Rec: #Sms Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:2.6 Ash:8.9 VM: 33.6 FC: 54.9					

Remarks: SM 22

Depth:608 Thickness: 2.0 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:1.7 Ash:16.2 VM: 31.7 FC: 50.4					

Remarks: SM 29

Depth:580 Thickness: 1.4 %Rec: #Sms Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:2.1 Ash:11.4 VM: 31.4 FC: 55.1					

Remarks: SM 28

Depth:656 Thickness: 2.0 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:1.6 Ash:6.92 VM: 34.4 FC: 56.7					

Remarks: SM 30

Depth:707 Thickness: 1.5 %Rec: #Sms 1 Sample Type:RC CMP

MACERALS			VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:1.7	Ash:6.6	VM: 32.7	FC: 59.0					

Remarks: SM 32

Depth:763 Thickness: 3.0 %Rec: #Sms 1 Sample Type:RC CMP

MACERALS			VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:1.4	Ash:7.5	VM: 32.7	FC: 58.4					

Remarks: SM 35

Depth:853 Thickness: 2.8 %Rec: #Sms 1 Sample Type:RC CMP

MACERALS			VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:1.1	Ash:14.2	VM: 27.3	FC: 57.4					

Remarks: SM 37

Depth:884 Thickness: 2.0 %Rec: #Sms 1 Sample Type:RC CMP

MACERALS			VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:1.8	Ash:15.7	VM: 25.2	FC: 57.3					

Remarks: SM 38

Depth:902 Thickness: 2.3 %Rec: #Sms 1 Sample Type:RC CMP

MACERALS			VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:2.1	Ash: 9.0	VM: 26.7	FC: 62.2					

Remarks: SM 39

Depth:953 Thickness: 3.6 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:1.1 Ash:10.6 VM: 27.0 FC: 61.3					

Remarks: SM 40

Depth:990 Thickness: 1.3 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:1.0 Ash:12.5 VM: 25.2 FC: 61.3					

Remarks: SM 42

Depth:1058 Thickness: 2.7 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:1.2 Ash:18.2 VM: 22.2 FC: 58.4					

Remarks: SM 46, BAYSWATER SM

DOYLES CREEK DDH 14 Basin: GUNNEDAH Lat and Long: 32 42'30"S 150 43'33"E
G49

Depth:304.37 Thickness: 3.44 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 7.4 Ash:18.3 VM: 42.6 FC: 31.7					

Remarks: SEAM 12. DETERMINED ANALYSIS EXCLUDING ASH >30%. DAF VM IS 42.7%

Depth:432.88 Thickness: 4.05 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 6.7 Ash: 9.0 VM: 52.1 FC: 32.1					

Remarks: SEAM 15. DETERMINED ANALYSIS. DAF VM IS 38.2%

DOYLES CREEK DDH 3 Basin: SYDNEY, NORTH Lat and Long: 32 34'52"S 150 48'38"E
S13

Depth:40.48 Thickness: 3.52 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.7	Ash:19.4	VM: 51.0	FC: 25.9				

Remarks: SEAM 1. CALCULATED COMP ANALYSIS. DAF VM IS 33.7%

Depth:73.62 Thickness: 2.07 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 4.6	Ash:31.1	VM: 41.6	FC: 22.7				

Remarks: SEAM 2. CALCULATED COMPOSITE ANALYSIS. DAF VM IS 35.3%

Depth:89.35 Thickness: 2.83 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.9	Ash:29.8	VM: 39.9	FC: 26.4				

Remarks: SEAM 3. CALCULATED ANALYSIS. DAF VM IS 39.8%

Depth:165.31 Thickness: 1.26 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:	Ash:	VM:	FC:				

Remarks: SEAM 6. CALCULATED ANALYSIS.

Depth:183.35 Thickness: 1.86 %Rec: #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 4.6	Ash:	VM: 45.0	FC: 27.6				

Remarks: SEAM 7. CALCULATED ANALYSIS. DAF VM IS 38.0%

Depth:256.90 Thickness: 5.27 %Rec: #Sms 1 Sample Type:CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:	Ash:49.6 VM:	FC:				

Remarks: SEAM 8. CALCULATED ANALYSIS.

Depth:264.63 Thickness: 5.23 %Rec: #Sms 1 Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:	Ash:47.6 VM:	FC:				

Remarks: SEAM 9. CALCULATED ANALYSIS.

DOYLES CREEK DDH 9 Basin: SYDNEY, NORTH Lat and Long: 32 47'10"S 151 06'13"E
S40

Depth:? Thickness: 2.87 %Rec: #Sms 1 Sample Type:?

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.9	Ash:14.3 VM: 54.6	FC: 28.2				

Remarks: SEAM 1

Depth:? Thickness: 1.43 %Rec: #Sms 1 Sample Type:?

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: ?		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 2.6	Ash:14.2 VM: 53.1	FC: 30.1				

Remarks: SEAM 2

Depth:? Thickness: 1.46 %Rec: #Sms 1 Sample Type:?

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: ?		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:	Ash:24.4 VM:	FC:				

Remarks: SEAM 12

Depth:? Thickness: 1.39 %Rec: #Sms 1 Sample Type:?

MACERALS VTRF% PROXIMATE ANALYSIS Basis: ? S% P% Cl% Bppm Other
V%: %: I%: Moist: 2.1 Ash:20.4 VM: 48.3 FC: 29.2

Remarks: SEAM 13

Depth:? Thickness: 1.60 %Rec: #Sms 1 Sample Type:

MACERALS VTRF% PROXIMATE ANALYSIS Basis: ? S% P% Cl% Bppm Other
V%: %: I%: Moist: 2.0 Ash:17.5 VM: 51.6 FC: 28.9

Remarks: SEAM 14

Depth:? Thickness: 2.01 %Rec: #Sms 1 Sample Type:?

MACERALS VTRF% PROXIMATE ANALYSIS Basis: ? S% P% Cl% Bppm Other
V%: %: I%: Moist: 2.4 Ash:10.3 VM: 57.5 FC: 29.8

Remarks: SEAM 16

Depth:? Thickness: 2.23 %Rec: #Sms 1 Sample Type:?

MACERALS VTRF% PROXIMATE ANALYSIS Basis: ? S% P% Cl% Bppm Other
V%: %: I%: Moist: 2.1 Ash:14.2 VM: 53.0 FC: 30.7

Remarks: SEAM 18

Depth:? Thickness: 2.53 %Rec: #Sms 1 Sample Type:?

MACERALS VTRF% PROXIMATE ANALYSIS Basis: ? S% P% Cl% Bppm Other
V%: %: I%: Moist: 1.8 Ash:12.0 VM: 55.8 FC: 30.4

Remarks: SEAM 19

Depth:? Thickness: 2.42 %Rec: #Sms 1 Sample Type:?

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis: ?		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5	Ash:13.3	VM: 56.5 FC: 28.7					

Remarks: SEAM 22

Depth:? Thickness: 3.06 %Rec: #Sms 1 Sample Type:?

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis: ?		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.4	Ash:16.0	VM: 56.1 FC: 25.5					

Remarks: SEAM 26

DRAKE NS 10
B21 C

Basin: BOWEN, NORTH Lat and Long: 21 21'54"S 147 53'06"E

Depth:145 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6	Ash:37.1	VM: 14.8 FC: 46.5	0.62				

Remarks:

Depth:146 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash:21.7	VM: 22.1 FC: 54.9	0.65				

Remarks:

Depth:148 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1	Ash: 8.8	VM: 25.0 FC: 65.1	0.74				

Remarks:

Depth:149 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.9	Ash: 7.5	VM: 26.2 FC: 65.4	0.81				

Remarks:

Depth:150 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5	Ash:24.0	VM: 21.5 FC: 53.0	0.68				

Remarks:

Depth:195 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2	Ash:16.9	VM: 22.9 FC: 59.0	0.43				

Remarks:

Depth:197 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash:24.0	VM: 21.1 FC: 53.6	0.39				

Remarks:

Depth:198 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash:28.3	VM: 19.7 FC: 50.7	0.38				

Remarks:

DRAKE NS 12,12A Basin: BOWEN, NORTH Lat and Long: 21 20'51"S 147 56'24"E
B21 A

Depth:175 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.5	Ash:17.2	VM: 23.7	FC: 56.6	0.32				

Remarks:

Depth:177 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.3	Ash:21.6	VM: 23.3	FC: 52.8	0.26				

Remarks:

Depth:178 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.8	Ash:31.2	VM: 8.4	FC: 56.6	0.53				

Remarks:

Depth:179 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.3	Ash:14.5	VM: 23.6	FC: 59.6	0.31				

Remarks:

Depth:179 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.3	Ash:17.1	VM: 24.1	FC: 56.5	0.29				

Remarks:

EMERALD NS 2 Basin: BOWEN, CENTRAL Lat and Long: 23 21'55"S 148 26'27"E
B78

Depth:121 Thickness: %Rec: #Sms 1 Sample Type:FLOATS

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 5.0	Ash:14.6	VM: 26.0	FC: 54.4	0.61				

Remarks: DAF S% IS 0.61

EMERALD NS 20 Basin: BOWEN, CENTRAL Lat and Long: 23 35'47"S 148 26'35"E
B89

Depth:65 Thickness: 2 %Rec: 1 #Sms Sample Type:CMP RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 5.6	Ash:14.9	VM: 25.1	FC: 54.4	1.44				.001

Remarks: OTHER IS F%. ANALYSIS OF ARIES SM.

Depth:74 Thickness: 1.23 %Rec: #Sms 1 Sample Type:CMP RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 6.6	Ash:10.3	VM: 25.4	FC: 57.7	1.07				0.001

Remarks: OTHER IS F%. ANALYSIS OF CASTOR SM

GALILEE NS 1 Basin: GALILEE Lat and Long: 23 09'30"S 146 23'00"E
A35 A

Depth:79.02 Thickness: 1.10 %Rec: 100 #Sms Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%: 55	%:2	I%:26		Moist:15.1	Ash:17.4	VM: 28.1	FC: 39.4					

Remarks: SEAM A. INERTINITE % = SEMI-INERTINITE (24%) + INERTINITE (2%)

Depth:79.96 Thickness: 0.94 %Rec: 97.4#Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 57	%:3 I%:31		Moist:15.5 Ash:8.8 VM: 30.4 FC: 45.3					

Remarks: SEAM A. INERTINITE % = SEMI-INERTINITE (29%) + INERTINITE (2%)

Depth:80.72 Thickness: 0.76 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 37	%:3 I%:47		Moist:12.9 Ash:13.1 VM: 26.7 FC: 47.3					

Remarks: SEAM A. INERTINITE % = SEMI-INERTINITE (45%) + INERTINITE (2%)

Depth:81.13 Thickness: 0.41 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 72	%:3 I%:16		Moist:16.3 Ash:8.7 VM: 31.4 FC: 43.6					

Remarks: SEAM A. INERTINITE % = SEMI-INERTINITE (15%) + INERTINITE (1%)

Depth:94.72 Thickness: 0.46 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 56	%:1 I%:19		Moist:12.6 Ash:23.8 VM: 25.4 FC: 38.2					

Remarks: SEAM B. INERTINITE % = SEMI-INERTINITE (17%) + INERTINITE (2%)

Depth:95.50 Thickness: 0.78 %Rec: 98.9#Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 56	%:4 I%:25		Moist:13.7 Ash:14.5 VM: 28.9 FC: 42.9					

Remarks: SEAM B. INERTINITE % = SEMI-INERTINITE (24%) + INERTINITE (1%)

Depth:96.29 Thickness: 0.79 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 58	%:3 I%:20		Moist:14.3 Ash:19.1 VM: 28.7 FC: 37.9					

Remarks: SEAM B. INERTINITE % = SEMI-INERTINITE (18%) + INERTINITE (2%)

Depth:96.66 Thickness: 0.37 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 49	%:2 I%:21		Moist:11.1 Ash:27.4 VM: 28.7 FC: 32.8					

Remarks: SEAM B. INERTINITE % = SEMI-INERTINITE (19%) + INERTINITE (2%)

Depth:97.50 Thickness: 0.84 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 68	%:3 I%:18		Moist:13.5 Ash:11.4 VM: 31.9 FC: 43.2					

Remarks: SEAM B. INERTINITE % = SEMI-INERTINITE (17%) + INERTINITE (1%)

Depth:169.70 Thickness: 0.87 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 29	%:3 I%:42		Moist:9.7 Ash:25.6 VM: 25.2 FC: 39.5					

Remarks: SEAM C. INERTINITE % = SEMI-INERTINITE (40%) + INERTINITE (2%)

Depth:171.68 Thickness: 1.98 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%: 47	%:2 I%:29		Moist:9.4 Ash:21.0 VM: 29.0 FC: 40.6					

Remarks: SEAM C. INERTINITE % = SEMI-INERTINITE (27%) + INERTINITE (2%)

Depth:186.31 Thickness: 1.31 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
Vt: 36	t:3	I%:44	Moist:9.3 Ash:17.2 VM: 27.9 FC: 45.6					

Remarks: SEAM D. INERTINITE % = SEMI-INERTINITE (42%) + INERTINITE (2%)

Depth:187.03 Thickness: 0.72 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
Vt: 54	t:3	I%:32	Moist:10.1 Ash:10.8 VM: 32.7 FC: 46.4					

Remarks: SEAM D. INERTINITE % = SEMI-INERTINITE (31%) + INERTINITE (1%)

Depth:187.97 Thickness: 0.94 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
Vt: 58	t:2	I%:30	Moist:10.6 Ash:10.2 VM: 32.6 FC: 46.6					

Remarks: SEAM D. INERTINITE % = SEMI-INERTINITE (28%) + INERTINITE (2%)

Depth:188.46 Thickness: 0.49 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
Vt:	t:	I%:	Moist:4.1 Ash:60.2 VM: 19.7 FC: 16.0					

Remarks: SEAM D.

Depth:189.79 Thickness: 1.33 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
Vt: 27	t:4	I%:51	Moist:8.8 Ash:17.9 VM: 27.4 FC: 45.9					

Remarks: SEAM D. INERTINITE % = SEMI-INERTINITE (48%) + INERTINITE (3%)

GALILEE NS 10 Basin: GALILEE Lat and Long: 22 25'45"S 146 26'06"E
A19 AY

Depth:234.9 Thickness: 0.84 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.4	Ash:9.3	VM: 32.7	FC: 50.6	0.42				

Remarks: SEAM A-B. ASH % OF RAW COAL = 9.9

Depth:236.8 Thickness: 1.91 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:6.2	Ash:24.5	VM: 23.0	FC: 46.3	0.31				

Remarks: SEAM A-B. ASH % OF RAW COAL = 40.3

Depth:238.5 Thickness: 1.70 %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.3	Ash:14.9	VM: 27.3	FC: 50.5	0.39				

Remarks: SEAM A-B. ASH % OF RAW COAL = 18.9

Depth:239.3 Thickness: 0.79 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.1	Ash:22.5	VM: 28.0	FC: 42.4	0.39				

Remarks: SEAM A-B. ASH % OF RAW COAL = 40.7

Depth: Thickness: 1.24 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.4	Ash:12.9	VM: 28.5	FC: 50.2	0.45				

Remarks: SEAM A-B. ASH % OF RAW COAL = 16.9

Depth:261.8 Thickness: 0.97 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.9	Ash:19.4	VM: 29.4	FC: 42.3	0.35				

Remarks: SEAM D SPLIT. ASH % OF RAW COAL = 21.5

Depth:334.2 Thickness: 1.78 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.2	Ash:18.1	VM: 27.8	FC: 45.9	0.38				

Remarks: SEAM D. ASH % OF RAW COAL = 37.9

Depth:336.6 Thickness: 2.44 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.2	Ash:8.9	VM: 32.7	FC: 50.2	0.42				

Remarks: SEAM D. ASH % OF RAW COAL = 11.0

Depth:338.2 Thickness: 1.57 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:4.6	Ash:44.7	VM: 19.5	FC: 31.2	0.25				

Remarks: SEAM D. ASH % OF RAW COAL = 47.6

Depth:338.9 Thickness: 0.76 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.5	Ash:12.8	VM: 30.5	FC: 47.2	0.45				

Remarks: SEAM D. ASH % OF RAW COAL = 14.0

Depth:345.1 Thickness: 2.03 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.7	Ash:8.9	VM: 33.3 FC: 50.1	0.44				

Remarks: SEAM E. ASH % OF RAW COAL = 17.6

Depth:349.0 Thickness: 0.97 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.1	Ash:13.1	VM: 29.2 FC: 50.6	0.39				

Remarks: SEAM F. ASH % OF RAW COAL = 18.9

Depth:349.6 Thickness: 0.63 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.1	Ash:30.9	VM: 24.7 FC: 36.3	0.27				

Remarks: SEAM F. ASH % OF RAW COAL = 66.7

Depth:351.2 Thickness: 1.52 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.3	Ash:11.2	VM: 29.1 FC: 51.4	0.41				

Remarks: SEAM F. ASH % OF RAW COAL = 13.3

GALILEE NS 15R A36 Y1 Basin: GALILEE Lat and Long: 23 31'07"S 146 20'00"E

Depth:217.49 Thickness: 2.35 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.3	Ash:7.8	VM: 32.1 FC: 49.8	0.42				

Remarks: SEAM D. ASH % OF RAW COAL = 15.2

GALILEE NS 2
A35 AY

Basin: GALILEE Lat and Long: 23 10'00"S 146 26'00"E

Depth:102.95 Thickness: 2.03 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:12.1 Ash:12.4 VM: 31.5 FC: 44.0					

Remarks: SEAM C.

Depth:120.85 Thickness: 9.58 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:10.5 Ash:21.1 VM: 26.2 FC: 42.2					

Remarks: SEAM D.

Depth:122.50 Thickness: 1.65 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:11.7 Ash:9.7 VM: 31.3 FC: 47.3					

Remarks: SEAM D.

Depth:123.55 Thickness: 1.05 %Rec: 97.5#Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:12.4 Ash:10.3 VM: 33.4 FC: 43.9					

Remarks: SEAM D.

Depth:124.87 Thickness: 1.32 %Rec: 100 #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:9.6 Ash:19.2 VM: 27.8 FC: 43.4					

Remarks: SEAM D.

Depth:167.13 Thickness: 1.35 %Rec: 100 #Sms Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.5	Ash:16.8	VM: 26.9 FC: 46.8					

Remarks: SEAM E.

GALILEE NS 21 A17 Y1

Basin: GALILEE Lat and Long: 22 01'36"S 146 20'11"E

Depth:129.40 Thickness: 1.04 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:5.4	Ash:26.8	VM: 26.6 FC: 41.2	0.29				

Remarks: SEAM B SPLIT. ASH % OF RAW COAL = 30.4

Depth:94.45 Thickness: 1.47 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:6.1	Ash:12.1	VM: 30.3 FC: 51.5	0.25				

Remarks: SEAM A-B. ASH % OF RAW COAL = 14.0

Depth:96.67 Thickness: 2.22 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:6.6	Ash:13.3	VM: 31.2 FC: 48.9	0.28				

Remarks: SEAM A-B. ASH % OF RAW COAL = 19.7

Depth:98.32 Thickness: 1.65 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.1	Ash:10.4	VM: 32.1 FC: 50.4	0.27				

Remarks: SEAM A-B. ASH % OF RAW COAL = 17.2

Depth:99.48 Thickness: 1.16 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:7.6	Ash:16.8	VM: 31.7	FC: 43.9	0.26				

Remarks: SEAM A-B. ASH % OF RAW COAL = 27.3

Depth:101.47 Thickness: 1.99 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:8.6	Ash:27.1	VM: 26.8	FC: 37.5	0.20				

Remarks: SEAM A-B. ASH % OF RAW COAL = 39.1

Depth:104.42 Thickness: 2.05 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:9.1	Ash:19.9	VM: 27.7	FC: 43.3	0.21				

Remarks: SEAM A-B. ASH % OF RAW COAL = 27.9

Depth:105.22 Thickness: 0.8 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:5.4	Ash:19.4	VM: 28.2	FC: 47.0	0.31				

Remarks: SEAM A-B.

Depth:170.18 Thickness: 1.63 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:4.2	Ash:29.7	VM: 24.2	FC: 41.9	0.22				

Remarks: SEAM C. ASH % OF RAW COAL = 43.4

Depth:171.28 Thickness: 1.10 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:5.2	Ash:19.8	VM: 31.4 FC: 43.6	0.42				

Remarks: SEAM C. ASH % OF RAW COAL = 21.9

Depth:177.22 Thickness: 0.85 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:5.6	Ash:27.0	VM: 2.55 FC: 41.9	0.29				

Remarks: SEAM D. ASH % OF RAW COAL = 29.6

Depth:179.52 Thickness: 2.3 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.0	Ash:15.2	VM: 31.1 FC: 46.7	0.29				

Remarks: SEAM D. ASH % OF RAW COAL = 17.2

Depth:181.35 Thickness: 1.83 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.9	Ash:13.1	VM: 30.6 FC: 47.4	0.25				

Remarks: SEAM D. ASH % OF RAW COAL = 26.5

Depth:220.25 Thickness: 1.23 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD			S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.0	Ash:17.8	VM: 26.3 FC: 46.9	0.24				

Remarks: SEAM E. ASH % OF RAW COAL = 32.0

Depth:221.86 Thickness: 1.61 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.9	Ash:8.4	VM: 30.1	FC: 51.6	0.26				

Remarks: SEAM E. ASH % OF RAW COAL = 10.2

Depth:232.72 Thickness: 2.06 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.1	Ash:27.3	VM: 24.0	FC: 41.6	0.24				

Remarks: SEAM F. ASH % OF RAW COAL = 34.9

Depth:235.15 Thickness: 2.43 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.5	Ash:13.0	VM: 25.0	FC: 52.5	0.15				

Remarks: SEAM F. ASH % OF RAW COAL = 17.6

GALILEE NS 24
A15 Y1

Basin: GALILEE Lat and Long: 21 25'52"S 146 02'27"E

Depth:121.65 Thickness: 1.10 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:c	I%:		Moist:8.5	Ash:17.9	VM: 27.2	FC: 46.4	0.30				

Remarks: SEAM C

Depth:122.4 Thickness: 0.77 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.5	Ash:19.8	VM: 29.3	FC: 42.4	0.30				

Remarks: SEAM C. F% = 0.007

Depth:124.2 Thickness: 1.79 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.6	Ash:17.1	VM: 30.3	FC: 43.0	0.26				

Remarks: SEAM C

Depth:132.76 Thickness: 1.48 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.5	Ash:20.5	VM: 26.4	FC: 44.6	0.29				

Remarks: SEAM C SPLIT. F% = 0.007

Depth:183.42 Thickness: 0.60 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.7	Ash:22.6	VM: 25.4	FC: 44.3	0.28				

Remarks: SEAM D

Depth:185.53 Thickness: 2.11 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.5	Ash:10.3	VM: 27.7	FC: 53.5	0.25				

Remarks: SEAM D

Depth:186.58 Thickness: 1.05 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.7	Ash:11.3	VM: 27.8	FC: 53.2	0.23				

Remarks: SEAM D. F% = 0.009

Depth:189.81 Thickness: 3.23 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.9	Ash:6.6	VM: 29.8	FC: 54.7	0.22				

Remarks: SEAM D

Depth:194.38 Thickness: 1.75 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.0	Ash:11.6	VM: 25.9	FC: 53.5	0.18				

Remarks: SEAM E. F% = 0.007

Depth:196.44 Thickness: 2.06 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.5	Ash:7.4	VM: 30.2	FC: 52.9	0.22				

Remarks: SEAM E

Depth:209.23 Thickness: 0.81 %Rec: #Sms Sample Type.FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.4	Ash:30.0	VM: 22.8	FC: 39.8	0.13				

Remarks: SEAM F

Depth:212.39 Thickness: 3.16 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.0	Ash:11.1	VM: 24.6	FC: 55.3	0.14				

Remarks: SEAM F. F% = 0.003

GALILEE NS 29
A16 Y1

Basin: GALILEE

Lat and Long: 21 43'08"S 146 09'28"E

Depth:145.26 Thickness: 1.31 %Rec: 94.7#Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.1	Ash:18.6	VM: 26.3	FC: 45.0	0.22				

Remarks: SEAM A-B

Depth:147.49 Thickness: 2.23 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:11.0	Ash:16.0	VM: 28.4	FC: 44.6	0.22				

Remarks: SEAM A-B

Depth:149.36 Thickness: 1.87 %Rec: 97.9#Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:11.7	Ash:10.6	VM: 31.8	FC: 45.9	0.21				

Remarks: SEAM A-B

Depth:150.40 Thickness: 1.04 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.7	Ash:21.9	VM: 27.5	FC: 39.9	0.30				

Remarks: SEAM A-B

Depth:154.17 Thickness: 2.07 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.8	Ash:23.4	VM: 27.5	FC: 40.3	0.20				

Remarks: SEAM A-B

Depth:155.38 Thickness: 0.44 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.4	Ash:36.1	VM: 20.6	FC: 34.9	0.16				

Remarks: SEAM A-B

Depth:156.84 Thickness: 1.46 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.0	Ash:25.0	VM: 22.7	FC: 44.3	0.24				

Remarks: SEAM A-B

Depth:157.81 Thickness: 0.97 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.9	Ash:27.4	VM: 23.4	FC: 41.3	0.21				

Remarks: SEAM A-B

Depth:159.13 Thickness: 1.32 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.4	Ash:27.4	VM: 23.1	FC: 41.1	0.20				

Remarks: SEAM A-B

Depth:160.55 Thickness: 1.42 %Rec: 98.6#Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.3	Ash:21.3	VM: 27.8	FC: 41.6	0.23				

Remarks: SEAM A-B

Depth:162.00 Thickness: 1.45 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.5	Ash:29.8	VM: 23.4	FC: 38.3	0.18				

Remarks: SEAM A-B

Depth:164.53 Thickness: 2.53 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.0	Ash:20.8	VM: 27.8	FC: 41.4	0.20				

Remarks: SEAM A-B

Depth:217.41 Thickness: 2.80 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.7	Ash:12.6	VM: 28.5	FC: 49.2	0.18				

Remarks: SEAM D

Depth:218.73 Thickness: 1.32 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.9	Ash:10.3	VM: 30.8	FC: 49.0	0.25				

Remarks: SEAM D

Depth:220.27 Thickness: 1.54 %Rec: 94.2#Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.5	Ash:12.1	VM: 31.5	FC: 45.9	0.27				

Remarks: SEAM D

Depth:226.08 Thickness: 1.86 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:11.5	Ash:6.9	VM: 30.4	FC: 51.2	0.28				

Remarks: SEAM E TOP

Depth:236.69 Thickness: 1.13 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.1	Ash:13.3	VM: 31.0	FC: 45.6	0.34				

Remarks: SEAM E BTM

Depth:253.18 Thickness: 2.96 %Rec: 99.7#Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.7	Ash:13.4	VM: 25.0	FC: 51.9	0.24				

Remarks: SEAM F

Depth:253.80 Thickness: 0.62 %Rec: 100 #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.2	Ash:29.9	VM: 19.7	FC: 43.2	0.21				

Remarks: SEAM F

GALILEE NS 33 Basin: GALILEE Lat and Long: 21 06'00"S 145 40'51"E
A14 Y1

Depth:221 Thickness: 1.09 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:7.5	Ash:21.3	VM: 26.4	FC: 44.8	0.20				

Remarks: SEAM D

Depth:265 Thickness: 1.28 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.3	Ash:8.4	VM: 26.3	FC: 57.0	0.26				

Remarks: SEAM E

Depth:268 Thickness: 1.81 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.6	Ash:10.9	VM: 25.6	FC: 47.9	0.22				

Remarks: SEAM E

GALILEE NS 5
A20 Y1

Basin: GALILEE Lat and Long: 22 48'30"S 146 25'00"E

Depth:216 Thickness: 2.6 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.3	Ash:11.5	VM: 32.8	FC: 45.4	0.22				

Remarks: SEAM A-B

Depth:218 Thickness: 1.8 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.4	Ash:11.9	VM: 32.7	FC: 47.0	0.21				

Remarks: SEAM A-B

Depth:219 Thickness: 1.1 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.8	Ash:18.8	VM: 31.0	FC: 41.4	0.23				

Remarks: SEAM A-B

Depth:227 Thickness: 2.8 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.8	Ash:16.1	VM: 32.1	FC: 43.0	0.24				

Remarks: SEAM A-B

Depth:228.5 Thickness: 1.9 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:10.4	Ash:17.3	VM: 31.3	FC: 41.0	0.24				

Remarks: SEAM A-B

Depth:283 Thickness: 0.9 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.5	Ash:30.7	VM: 22.3	FC: 38.5	0.22				

Remarks: SEAM C

Depth:284 Thickness: 1.2 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:9.7	Ash:29.9	VM: 24.5	FC: 35.9	0.28				

Remarks: SEAM C

Depth:285 Thickness: 1.5 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist:8.7	Ash:29.6	VM: 24.3	FC: 37.4	0.33				

Remarks: SEAM C

Depth:287 Thickness: 1.8 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:9.2 Ash:27.6 VM: 23.7 FC: 39.5	0.31				

Remarks: SEAM C

Depth:300 Thickness: 1.2 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:8.7 Ash:27.7 VM: 25.5 FC: 38.1	0.31				

Remarks: SEAM D

Depth:301 Thickness: 0.9 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:9.5 Ash:17.3 VM: 32.8 FC: 40.4	0.64				

Remarks: SEAM D

GALILEE NS E A19 BY Basin: GALILEE Lat and Long: 22 25'07"S 146 28'03"E

Depth:147.6 Thickness: 2.44 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:6.9 Ash:31.4 VM: 23.6 FC: 38.1					

Remarks: SEAM C. ASH % OF RAW COAL = 45.3

Depth:157.9 Thickness: 1.70 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:7.3 Ash:14.4 VM: 32.6 FC: 45.7					

Remarks: SEAM D. ASH % OF RAW COAL = 27.4

Depth:158.7 Thickness: 0.79 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:7.9 Ash:12.4 VM: 33.0 FC: 46.7					

Remarks: SEAM D, ASH % OF RAW COAL = 15.5

Depth:174.8 Thickness: 1.75 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:8.7 Ash:11.0 VM: 31.8 FC: 48.5					

Remarks: SEAM E, ASH % OF RAW COAL = 20.0

Depth:195.0 Thickness: 1.30 %Rec: #Sms Sample Type:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist:9.3 Ash:11.1 VM: 31.0 FC: 48.6					

Remarks: SEAM F, ASH % OF RAW COAL = 14.3

GLOUCESTER BASIN Basin: GLOUCESTER Lat and Long: 32 07'15"S 151 56'30"E
S22

Depth:950 Thickness: %Rec: #Sms Sample Type:WC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.6 Ash: 7.4 VM: 32.6 FC: 57.4	0.71	0.01			

Remarks: CRAVEN CM, SEAM K1. SAMPLE FROM DEPTH OF <100 M, NORANDA DRILLHOLE C47

Depth:950 Thickness: %Rec: #Sms Sample Type:WC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.8 Ash: 8.4 VM: 36.9 FC: 52.9	0.45				

Remarks: CRAVEN CM, SEAM C2. SAMPLE FROM DEPTH OF <100 M, NORANDA DRILLHOLE C13

Depth:1597 Thickness: 1.5 %Rec: #Sms Sample Type:WC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.4 Ash: 6.9 VH: 29.0 FC: 62.7	0.63	0.01			

Remarks: GLOUCESTER CM, GLOUCESTER SM. FROM DEPTH OF <100 M, NORANDA C42

Depth:1597 Thickness: %Rec: #Sms Sample .ype:FLOAT

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.5 Ash: 8.3 VH: 28.2 FC: 62.0	0.54				

Remarks: GLOUCESTER CM, GLOUCESTER SM. FROM DEPTH OF <100 M, NORANDA C52

Depth:1597 Thickness: 1.5 %Rec: #Sms Sample Type:WC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.1 Ash: 6.0 VH: 32.4 FC: 59.5	0.56				

Remarks: GLOUCESTER CM, SM H4. FROM DEPTH OF <100 M, NORANDA DRILLHOLE C18

Depth:TD Thickness: %Rec: #Sms Sample Type:WC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.1 Ash: 9.3 VH: 37.8 FC: 51.8	2.10	0.08			

Remarks: DEWPANG FM, BASAL SEAM. FROM DEPTH OF <100 M, NORANDA DRILLHOLE C46

Depth:TD Thickness: %Rec: #Sms Sample Type:WC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.1 Ash: 9.0 VH: 33.6 FC: 56.4	1.00	0.05			

Remarks: DEWRANG FM, BASAL SEAM. FROM DEPTH OF <100 M, NORANDA DRILLHOLE C48

GOULBURN VALLEY DDH1 Basin: GUNNEDAH Lat and Long: 32 23'27"S 150 31'19"E
G46

Depth:489.69 Thickness: 1.33 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.5	Ash:14.5	VM: 29.8	FC: 53.2	0.42				

Remarks: SM 24. COMPOSITE ANALYSIS EXCLUDING ASH >30%. DAF VM IS 35.9%

Depth:530.43 Thickness: 162 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.6	Ash:17.4	VM: 31.4	FC: 48.6	0.74				

Remarks: SM 26. COMPOSITE ANALYSIS EXCLUDING ASH >30%. DAF VM IS 39.3%

GOULBURN VALLEY DDH2 Basin: GUNNEDAH Lat and Long: 32 25'12"S 150 19'50"E
G42

Depth: 77.47 Thickness: 0.64 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.6	Ash:21.3	VM: 28.8	FC: 46.3	0.52				

Remarks: SM 4. ANALYSIS EXCLUDES ASH >30%. DAF VM IS 38.3%

Depth: 81.30 Thickness: 1.04 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 4.0	Ash:19.9	VM: 32.1	FC: 44.0	0.42				

Remarks: SM 5. ANALYSIS OF 3 SAMPLED HORIZONS. DAF VM IS 42.2%

Depth:253.04 Thickness: 1.43 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.8 Ash:11.9 VM: 35.2 FC: 49.1					

Remarks: SM 7. EXCLUDING ASH >30%. DAF VM IS 41.8%

Depth:295.52 Thickness: 1.48 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.2 Ash:12.8 VM: 32.5 FC: 51.5					

Remarks: SM 11. EXCLUDES ASH >30%. DAF VM IS 38.5%

Depth:344.56 Thickness: 1.09 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.6 Ash:17.7 VM: 26.2 FC: 53.5					

Remarks: SM 13. DAF VOLATILE MATTER IS 32.9%

Depth:347.06 Thickness: 1.06 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.3 Ash:24.1 VM: 26.6 FC: 47.0					

Remarks: SM 14. EXCLUDING ASH >30%. DAF VM IS 36.1%

Depth:351.00 Thickness: 1.43 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2.6 Ash:12.5 VM: 31.1 FC: 52.8					

Remarks: SM 15. EXLUDING ASH >30%. DAF VM IS 37.1%

Depth:391.20 Thickness: 3.61 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.6 Ash:18.9 VM: 26.2 FC: 52.3						

Remarks: SM 17. EXCLUDING ASH >30%. DAF VM IS 33.4%. BAYSWATER SM.

GROSVENOR NS 1
B22 D

Basin: BOWEN, NORTH Lat and Long: 21 31'24"S 147 55'54"E

Depth:206 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.2 Ash:27.4 VM: 17.2 FC: 54.2		0.39				

Remarks:

GROSVENOR NS 14
B29

Basin: BOWEN, NORTH Lat and Long: 21 50'27"S 148 00'50"E

Depth:282.91 Thickness: 3.70 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.6 Ash: 8.8 VM: 20.4 FC: 69.2		0.49	0.025			

Remarks: GOONYELLA MIDDLE SM

Depth:286.58 Thickness: 2.68 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash: 6.0 VM: 23.4 FC: 69.5		0.53	0.035			

Remarks: GOONYELLA MIDDLE SM

Depth:357.78 Thickness: 1.08 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.4 Ash:11.8 VM: 17.5 FC: 69.3	0.52				

Remarks: GOONYELLA LOWER SM

Depth:358.86 Thickness: 0.58 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.2 Ash:14.3 VM: 19.0 FC: 65.5	0.52				

Remarks: GOONYELLA LOWER SM

Depth:359.44 Thickness: 0.57 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.3 Ash:15.4 VM: 18.0 FC: 65.3	0.50				

Remarks: GOONYELLA LOWER SM

Depth:360.01 Thickness: 1.19 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.1 Ash:10.2 VM: 19.2 FC: 69.5	0.52				

Remarks: GOONYELLA LOWER SM

Depth:361.52 Thickness: 0.76 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.3 Ash: 9.1 VM: 18.7 FC: 70.9	0.50				

Remarks: GOONYELLA LOWER SM

Depth:362.28 Thickness: 0.53 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.0 Ash: 6.6 VM: 21.0 FC: 71.4		0.50				

Remarks: GOONYELLA LOWER SM

Depth:362.81 Thickness: 0.73 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.9 Ash: 3.4 VM: 21.7 FC: 74.0		0.54				

Remarks: GOONYELLA LOWER SM

Depth:363.54 Thickness: 0.45 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.8 Ash: 4.3 VM: 22.2 FC: 72.7		0.53				

Remarks: GOONYELLA LOWER SM

Depth:363.25 Thickness: 0.54 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.8 Ash: 5.7 VM: 22.0 FC: 71.5		0.56				

Remarks: GOONYELLA LOWER SM

GROSVENOR NS 2 Basin: BOWEN, NORTH Lat and Long: 21 30'56"S 147 56'42"E
B22 C

Depth:248 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.7 Ash:38.8 VM: 16.4 FC: 42.4		1.38				

Remarks:

Depth:249 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.6 Ash:23.6 VM: 20.2 FC: 54.6	0.5				

Remarks:

Depth:250 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.2 Ash:15.3 VM: 22.4 FC: 61.1	0.53				

Remarks:

Depth:251 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.0 Ash: 8.9 VM: 25.5 FC: 64.6	0.61				

Remarks:

Depth:350 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.4 Ash:26.4 VM: 17.5 FC: 54.7	0.42				

Remarks:

Depth:351 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.4 Ash:29.1 VM: 17.5 FC: 52.0	0.61				

Remarks:

Depth:351 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.3 Ash:13.7 VM: 17.9 FC: 67.1	0.46				

Remarks:

Depth:352 Thickness: %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.0 Ash:10.3 VM: 19.4 FC: 69.3	0.48				

Remarks:

Depth:353 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.2 Ash:28.7 VM: 17.4 FC: 52.7	0.37				

Remarks:

Depth:354 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.1 Ash:20.1 VM: 19.4 FC: 59.4	0.43				

Remarks:

Depth:422 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.5 Ash:44.5 VM: 12.7 FC: 41.3	0.43				

Remarks:

Depth:423 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.2	Ash:25.4	VM: 17.8	FC: 55.6	0.42				

Remarks:

Depth:423.5 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 2 2	Ash:48.3	VM: 13.3	FC: 36.2	0.27				

Remarks:

Depth:424 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.4	Ash:31.8	VM: 15.1	FC: 51.7	0.45				

Remarks:

Depth:425 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.1	Ash:14.8	VM: 16.7	FC: 67.4	0.5				

Remarks:

Depth:426 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.9	Ash: 6.7	VM: 19.4	FC: 73.0	0.54				

Remarks:

Depth:427 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.9 Ash: 4.7 VM: 19.5 FC: 74.9		0.59				

Remarks:

GROSVENOR NS 23 Basin: BOWEN, NORTH Lat and Long: 22 06'47"S 148 05'20"E
B37

Depth:244 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.1 Ash:10.4 VM: 24.1 FC: 64.4		0.60	0.007			

Remarks:

Depth:245 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3 Ash: 7.7 VM: 21.7 FC: 69.3		0.53	0.057			

Remarks:

GROSVENOR NS 3 Basin: BOWEN, NORTH Lat and Long: 21 31'07"S 147 58'00"E
B22 B

Depth:179 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.6 Ash:35.9 VM: 21.7 FC: 39.8		0.36				

Remarks:

Depth:180 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.8	Ash:26.6	VM: 24.8	FC: 45.8	0.47				

Remarks:

GROSVENOR NO 49R Basin: BOWEN, NORTH Lat and Long: 21 56'08"S 148 00'02"E
B31

Depth:158 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 2.0	Ash:22.0	VM: 23.8	FC: 52.2	0.73	0.013			

Remarks:

Depth:204 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.9	Ash: 9.9	VM: 25.9	FC: 62.3					

Remarks:

Depth:296 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash: 9.6	VM: 23.9	FC: 65.2					

Remarks:

GROSVENOR NS 73 Basin: BOWEN, NORTH Lat and Long: 21 38'17"S 147 59'00"E
B24

Depth:229.53 Thickness: 1.52 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%: 65	%:--	I%:26*	1.13	Moist: 1.3	Ash:10.0	VM: 24.7	FC: 64.0	0.56	0.006			

Remarks: GOONYELLA UPPER SM. *MACI%: 22% SEMI-I, 4% INERT.

Depth:231.05 Thickness: 1.71 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%: 65	%:--	I%:26*	1.13	Moist: 1.4	Ash:9.1	VM: 24.9	FC: 64.6	0.54	0.007			

Remarks: GOONYELLA UPPER SM. *MACI%: 22% SEMI-I, 4% I

Depth:342.66 Thickness: 2.01 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.8	Ash:12.9	VM: 18.7	FC: 66.6	0.43	0.005			

Remarks: GOONYELLA MIDDLE SM

Depth:344.67 Thickness: 1.92 %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%: 37	%: -	I%:54*	1.32	Moist: 1.3	Ash: 8.5	VM: 20.0	FC: 70.0	0.40	0.032			

Remarks: GOONYELLA MIDDLE SM. *MACI%: 51% SEMI-I, 3% I. 9% MIN.MAT.

Depth:346.59 Thickness: 2.30 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3	Ash: 6.2	VM: 22.1	FC: 70.4	0.45	0.056			

Remarks: GOONYELLA MIDDLE SM

Depth:348.89 Thickness: 0.88 %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist: 1.0	Ash: 7.7	VM: 21.2	FC: 70.1	0.54	0.009			

Remarks: GOONYELLA MIDDLE SM

HOWES VALLEY DDH 1 Basin: SYDNEY, NORTH Lat and Long: 32 52'31"S 150 48'37"E
S42

Depth:658 Thickness: 1.2 %Rec: #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:2.7	Ash:19.3	VM:	FC:					

Remarks: SEAM 1, CALC. COMPOSITE OF WHOLE SECTION

Depth:694 Thickness: 2.7 %Rec: #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:2.8	Ash:16.9	VM: 24.3	FC: 56.0					

Remarks: SEAM 2, DETERMINED ANALYSIS OF COMPOSITE. D.A.F. VM% = 30.3

Depth:713 Thickness: 2.4 %Rec: #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:2.7	Ash:15.6	VM: 31.2	FC: 50.5					

Remarks: SEAM 3, DETERMINED ANALYSIS OF COMPOSITE. D.A.F. VM% = 38.2

Depth:758 Thickness: 1.8 %Rec: #Sms Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:	Moist:4.4	Ash:43.9	VM:	FC:					

Remarks: SEAM 6, CALC. COMPOSITE OF WHOLE SECTION

Depth:738 Thickness: 0.8 %Rec: #Sms Sample Type:RC

MACERALS VTRF% PROXIMATE ANALYSIS Basis: AD S% P% Cl% Bppm Other
V%: %: I%: Moist:2.6 Ash:14.1 VM: FC:

Remarks: SEAM 6, CALC. COMPOSITE OF WHOLE SECTION EXCLUDING ASH >30%

Depth:917 Thickness: 2.7 %Rec: #Sms Sample Type:RC

MACERALS VTRF% PROXIMATE ANALYSIS Basis: AD S% P% Cl% Bppm Other
V%: %: I%: Moist:1.9 Ash:17.5 VM: 30.9 FC: 49.7

Remarks: SEAM 15, DETERMINED ANALYSIS OF COMPOSITE EXCLUDING ASH >30%

HUGHENDEN 7 Basin: GALILEE Lat and Long: 20 57'00"S 144 11'00"E
A5

Depth:877 Thickness: 1.05 %Rec: #Sms Sample Type:FLOAT

MACERALS VTRF% PROXIMATE ANALYSIS Basis: S% P% Cl% Bppm Other
V%: %: I%: Moist: 3.4 Ash:36.3 VM: 19.0 FC: 41.3 0.20

Remarks: ASH % OF RAW COAL = 59.0

Depth:881 Thickness: 3.78 %Rec: #Sms Sample Type:FLOAT

MACERALS VTRF% PROXIMATE ANALYSIS Basis: S% P% Cl% Bppm Other
V%: %: I%: Moist: 6.2 Ash:15.5 VM: 23.9 FC: 54.4 0.20

Remarks: ASH % OF RAW COAL = 19.8

Depth:883 Thickness: 2.12 %Rec: #Sms Sample Type:FLOAT

MACERALS VTRF% PROXIMATE ANALYSIS Basis: S% P% Cl% Bppm Other
V%: %: I%: Moist: 6.1 Ash: 8.3 VM: 24.3 FC: 61.3 0.19

Remarks: ASH % OF RAW COAL = 14.5

Depth:886 Thickness: 2.38 %Rec: #Sms Sample Type:FLOAT

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 6.4	Ash:11.2	VM: 25.5	FC: 56.9	0.21				

Remarks: ASH % OF RAW COAL = 13.1

JERRYS PLAINS DDH 6 Basin: SYDNEY, NORTH Lat and Long: 32 22'20"S 150 46'04"E
S7

Depth:22.50 Thickness: 1.30 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 5.0	Ash:11.9	VM: 33.6	FC: 49.5					

Remarks: SM 1. EXCLUDES ASH >30%. DAF VM IS 40.4%

Depth:51.37 Thickness: 3.17 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 4.9	Ash: 5.5	VM: 36.4	FC: 53.2					

Remarks: SM 2. EXCLUDES ASH >30%. DAF VM IS 40.6%

Depth:131.15 Thickness: 1.45 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.7	Ash:10.4	VM: 31.6	FC: 54.3					

Remarks: SM 6. EXCLUDES ASH >30%. DAF VM IS 36.8%

Depth:153.15 Thickness: 3.13 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 3.4	Ash:13.7	VM: 30.2	FC: 52.7					

Remarks: SM 7. EXCLUDES ASH >30%. DAF VM IS 36.4%

JERRYS PLAINS DDH 8 Basin: SYDNEY, NORTH Lat and Long: 32 25'41"S 150 44'00"E
S8

Depth:131.49 Thickness: 1.35 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 5.0 Ash:15.8 VM: 32.3 FC: 46.9					

Remarks: SM 5. EXCLUDES ASH >30%. DAF VM IS 40.8%

Depth:170.14 Thickness: 3.99 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 4.7 Ash:14.0 VM: 28.7 FC: 52.6					

Remarks: SM 6. EXCLUDES ASH >30%. DAF VM IS 35.3%

MULGOA 2 Basin: SYDNEY, CENTRAL Lat and Long: 33 48'40"S 150 38'27"E
S77

Depth:789 Thickness: %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 1.8 Ash:14.7 VM: 24.5 FC: 59.0	0.5				

Remarks: MIDDLE RIVER SEAM. DRY ASH-FREE, VM 29.3%, S 0.6%

NATIONAL PARK (SC) 2 Basin: SYDNEY, SOUTH Lat and Long: 34 07'11"S 151 00'20"E
S97

Depth:558 Thickness: %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis:	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 0.55Ash: 20.01VM: 16.95FC: 62.49					

Remarks: BULLI SEAM. COKE %, 82.50

Depth:580 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 0.30	Ash: 14.12	VM: 19.75	FC: 65.83	0.343		

Remarks: BALGOWNIE SEAM. COKE %, 79.95

STRATHEARN DDH 1 Basin: GUNNEDAH Lat and Long: 32 09'44"S 150 50'54"E
G51

Depth: Thickness: %Rec: 95 #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 5.1	Ash: 16.8	VM: 46.4	FC: 31.7					

Remarks: SM 10. ANALYSIS EXCLUDES ASH > 35%. DAF VOLATILE MATTER 40.6%

Depth: Thickness: %Rec: 93 #Sms 1 Sample Type:CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 5.2	Ash: 12.4	VM: 50.2	FC: 32.2					

Remarks: SM 11. EXCLUDES ASH >35%. DAF VM IS 39.1%.

TALBOT NS 239 Basin: BOWEN, CENTRAL Lat and Long: 23 27'29"S 148 29'16"E
B80

Depth:58.17 Thickness: 0.78 %Rec: #Sms 1 Sample Type:FLOATS

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD				S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 6.5	Ash: 13.8	VM: 27.1	FC: 52.6	0.48				

Remarks: ARIES I SM

Depth:72.58 Thickness: 5.87 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 6.0 Ash:10.6 VM: 27.7 FC: 57.7		0.34	0.068			

Remarks: ARIES-CASTOR SM. DAF VM IS 31.0%. ASH ANALYSIS IN REFERENCE

TALBOT NS 48
B66

Basin: BOWEN, CENTRAL Lat and Long: 23 00'46"S 148 36'30"E

Depth:191 Thickness: %Rec: #Sms 1 Sample Type:FLOATS

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.3 Ash:10.2 VM: 19.0 FC: 69.5		0.56	0.07			

Remarks: AVERAGE ANALYSIS FOR AQUILA SM. DAV VM IS 21.5%

Depth:226 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS Basis:		S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 4.7 Ash:32.5 VM: 14.1 FC: 48.7		1.80	0.08			

Remarks: AVERAGE ANALYSIS FOR TIERI SM. DAF VM IS 22.5%

Depth:300 Thickness: %Rec: #Sms 1 Sample Type:FLOATS

	MACERALS			VTRF%	PROXIMATE ANALYSIS Basis: AD		S%	P%	Cl%	Bppm	Other
V%: 75.0	%:12.0*	I%: 4.0	1.58		Moist: 1.1 Ash: 9.1 VM: 18.2 FC: 71.6		0.52	0.06	9.00		9.0 MM

Remarks: AVERAGE OF GERMAN CK SM. EXINITE-SEMI-INERTINITE IN REPORT*'

TALBOT NS 6 Basin: BOWEN, CENTRAL Lat and Long: 23 07'50"S 148 30'49"E
B68

Depth:140 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%:	%:	I%:		Moist: 1.5	Ash: 9.1	VM: 29.1	FC: 60.3	0.3	0.04		

Remarks: DAF VOLATILE MATTER IS 32.6%

THEODORE NS 37 Basin: BOWEN, SOUTH-EAST Lat and Long: 24 52'31"S 150 01'42"E
B146

Depth:102 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%: 57.4	%: 2.9	I%:31.9	0.774	Moist: 4.8	Ash: 9.5	VM: 32.0	FC:	0.27			16.66

Remarks: 2 SEAM TOPS. INERT INCLUDES 27.7% SEMI-INTERT. OTHER=C/H. DAF VM =37.3%

Depth:126 Thickness: %Rec: #Sms Sample Type:

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%: 60.0	%: 2.5	I%:30.8		Moist: 5.4	Ash: 9.5	VM: 30.0	FC:	0.31			

Remarks: 2 SEAM BOTTOMS. INERTINITE INCLUDES 27.2% SEMI-INERT. DAF VM IS 35.2%

Depth:151 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS		VTRF%	PROXIMATE ANALYSIS	Basis:	AD	S%	P%	Cl%	Bppm	Other
V%: 58.3	%: 2.2	I%:33.2		Moist: 5.2	Ash: 8.4	VM: 31.5	FC:	0.29			

Remarks: 3 SEAM. INERTINITE INCLUDES 29.6% SEMI-INERT. DAF VM IS 31.5%

Depth:192 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 61.9	%: 2.2 I%:31.5		Moist: 5.2 Ash: 6.7 VM: 31.3 FC:	0.29				

Remarks: 4 SEAM. INERTINITE INCLUDES 27.4% SEMI-INERT. DAF VM IS 35.5%

Depth:217 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 68.4	%: 2.1 I%:24.6		Moist: 4.5 Ash: 7.7 VM: 32.8 FC:	0.3				

Remarks: 5 SEAM. INERT INCLUDES 22.1% SEMI-INERT. DAF VM IS 37.4%

Depth:251 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 65.7	%: 2.3 I%:26.2		Moist: 4.1 Ash: 8.9 VM: 32.6 FC: 32.6	0.39				

Remarks: 6 SEAM. INERTINITE INCLUDES 23.3% SEMI-INERT. DAF VM IS 37.5%

Depth:265 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 69.4	%: 2.1 I%:22.4		Moist: 4.0 Ash: 7.3 VM: 33.0 FC:	0.42				

Remarks: 7 SEAM. INERTINITE INCLUDES 19.5% SEMI-INERT. DAF VM IS 37.2%

Depth:296 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 64.4	%: 2.6 I%:23.9	0.802	Moist: 3.6 Ash:13.1 VM: 30.9 FC:	1.04				16.2

Remarks: 8 SEAM. INERT INCLUDES 20.7% SEMI-INERT. OTHER=C/H. DAF VM IS 37.1%

Depth:321 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 69.0	%: 1.1 I%:17.2		Moist: 5.4 Ash:15.2 VM: 29.6 FC:	0.33				

Remarks: 9 SEAM. INERTINITE INCLUDES 14.3% SEMI-INERT. DAF VH IS 37.3%

Depth:329 Thickness: %Rec: #Sms 1 Sample Type:RC

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%: 68.1	%: 2.4 I%:22.0	0.873	Moist: 3.3 Ash:13.0 VM: 29.1 FC:	0.39				16.35

Remarks: 10 SEAM. INERT INCLUDES 18.8% SEMI-INERT. OTHER=C/H. DAF VM IS 34.8%

WALFORD GULLY S72 Basin: SYDNEY, WEST Lat and Long: 33 37'36"S 150 21'33"E

Depth:152 Thickness: 1.3 %Rec: #Sms Sample Type:

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 3.4 Ash: 6.2 VM: 26.4 FC: 64.0					

Remarks: KATOOMBA SEAM. D.A.F. VM=29.2%

WIDDEN DDH 2 G41 Basin: GUNNEDAH Lat and Long: 32 34'00"S 150 19'04"E

Depth:67 Thickness: 1.64 %Rec: #Sms 1 Sample Type:RC CMP

	MACERALS	VTRF%	PROXIMATE ANALYSIS Basis: AD	S%	P%	Cl%	Bppm	Other
V%:	%: I%:		Moist: 4.1 Ash: 8.1 VM: 32.7 FC: 55.1					

Remarks: SM 4. DAF VOLATILE MATTER IS 37.2%

Depth:178 Thickness: 7.73 %Rec: #Sms 1 Sample Type:RC CMP

MACERALS VTRF% PROXIMATE ANALYSIS Basis: AD S% P% Cl% Bppm Other
V%: %: I%: Moist: 2.9 Ash:17.1 VM: 27.7 FC: 52.3

Remarks: SM 13. BAYSWATER SM. EXCLUDES ASH >30%. DAF VH IS 34.6%

YERRINBOOL 1
S103Y1

Basin: SYDNEY, SOUTH Lat and Long: 34 23'18"S 150 31'18"E

Depth:270 Thickness: %Rec: #Sms Sample Type:

MACERALS VTRF% PROXIMATE ANALYSIS Basis: S% P% Cl% Eppm Other
V%: %: I%: Moist: 0.90Ash: 18.00VM: 24.26FC: 56.84

Remarks: BULLI SEAM. COKE % 74.84

CONTROL POINT LOCATIONS

CHARTERS TOWERS 1	A1	20	19°11"145	54°55"E
GOLEBURRA 1	A10 X1	22	25°01"142	36°35"E
GOLEBURRA 1	A10 Y1	22	25°01"142	36°35"E
OOROOHOO 1	A11 X1	21	10°50"141	33°09"E
OOROOHOO 1	A11 Y1	23	10°50"141	33°09"E
TOWERHILL A-1	A12 X1	21	43°06"144	40°50"E
TOWERHILL A-1	A12 Y1	21	43°06"144	40°50"E
TOWERHILL A-1	A12 Y2	21	43°06"144	40°50"E
KOBURRA 1	A13 X1	21	17°48"145	18°06"E
KOBURRA 1	A13 Y1	21	17°48"145	18°06"E
KOBURRA 1	A13 Y2	21	17°48"145	18°06"E
GALILEE NS 33	A14 X1	21	06°00"145	40°51"E
GALILEE NS 33	A14 Y1	21	06°00"145	40°51"E
GALILEE NS 24	A19 X1	21	25°52"146	02°27"E
GALILEE NS 24	A19 Y1	21	25°52"146	02°27"E
GALILEE NS 29	A16 X1	21	41°08"146	09°28"E
GALILEE NS 29	A16 Y1	21	41°08"146	09°29"E
GALILEE NS 21	A17 X1	22	01°36"146	20°11"E
GALILEE NS 21	A17 Y1	22	01°36"146	20°11"E
LAKE GALILEE 1	A18 X1	22	11°33"145	58°32"E
LAKE GALILEE 1	A18 Y1	22	11°33"145	58°32"E
LAKE GALILEE 1	A18 Y2	22	11°33"145	58°32"E
GALILEE NS 10,8	A19 X1	22	25°45"146	26°08"E
GALILEE NS 10,8	A19 Y1	22	25°45"146	26°03"E
HUGHENDEN 1-4R	A2	20	38°00"145	21°00"E
GALILEE NS 5	A20 X1	22	48°30"146	25°00"E
GALILEE NS 5	A20 Y1	22	48°30"146	25°00"E
HEXHAM 1	A21 X1	22	48°22"145	57°08"E
HEXHAM 1	A21 Y1	22	48°22"145	57°08"E
ARAMAC 1	A22 X1	22	56°56"145	17°03"E
ARAMAC 1	A22 Y1	22	56°56"145	17°03"E
THUNDERBOLT 1	A23 X1	22	22°02"145	00°10"E
THUNDERBOLT 1	A23 Y1	22	22°02"145	00°10"E
THUNDERBOLT 1	A23 Y2	22	22°02"145	00°10"E
BERYL 1	A24 X1	22	22°08"143	58°26"E
BERYL 1	A24 Y1	22	22°08"143	58°26"E
BERYL 1	A24 Y2	22	22°08"143	58°26"E
BROOKWOOD 1	A25 X1	22	28°55"144	19°58"E
BROOKWOOD 1	A25 Y1	22	28°55"144	19°58"E
BROOKWOOD 1	A25 Y2	22	28°55"144	19°58"E
MUTTABURRA 1	A26 X1	22	48°33"144	31°35"E
MUTTABURRA 1	A26 Y1	22	48°33"144	31°35"E
MUTTABURRA 1	A26 Y2	22	48°33"144	31°35"E
GLENARAS 1	A27 X1	23	05°52"144	43°23"E
GLENARAS 1	A27 Y1	23	05°52"144	43°23"E
GLENARAS 1	A27 Y2	23	05°52"144	43°23"E
RAND 1	A28 X1	23	07°23"144	43°06"E
RAND 1	A28 Y1	23	07°23"144	43°06"E
RAND 1	A28 Y2	23	07°23"144	43°06"E
MARCHMONT 1	A29 X1	23	10°15"144	44°21"E
MARCHMONT 1	A29 Y1	23	10°15"144	44°21"E
MARCHMONT 1	A29 Y2	23	10°15"144	44°21"E
HUGHENDEN 6	A3	20	21°00"144	27°00"E
SALTERN CREEK 1	A30 X1	23	20°54"144	56°24"E
SALTERN CREEK 1	A30 Y1	23	20°54"144	56°24"E
SALTERN CREEK 1	A30 Y2	23	20°54"144	56°24"E
HULTON 1	A31 X1	23	23°25"144	55°20"E
HULTON 1	A31 Y1	23	23°25"144	55°20"E
HULTON 1	A31 Y2	23	23°25"144	55°20"E
MARANDA 1	A32 X1	23	12°14"145	26°40"E
MARANDA 1	A32 Y1	23	12°14"145	26°40"E
MARANDA 1	A32 Y2	23	12°14"145	26°40"E
COREENA 1	A33 X1	23	18°53"145	23°19"E
COREENA 1	A33 Y1	23	18°53"145	23°19"E

COREENA 1	A11	Y2	21	18°51"	145	21'19"E
ALICE RIVER 1	A34	X1	21	17'08"	145	19'15"E
ALICE RIVER 1	A34	Y1	21	17'08"	145	19'15"E
ALICE RIVER 1	A34	Y1	21	17'08"	145	19'15"E
GALILEE BS 1,2	A15	X1	21	09'30"	146	21'00"E
GALILEE BS 1,2	A15	Y1	21	09'30"	146	21'00"E
GALILEE BS 1&R	A16	X1	21	11'07"	146	20'00"E
GALILEE BS 1&R	A16	Y1	21	11'07"	146	20'00"E
GSQ JERICHO 1	A17		21	38'00"	146	22'00"E
AOD JERICHO 1	A18	X1	21	46'19"	146	05'01"E
AOD JERICHO 1	A18	Y1	21	46'19"	146	05'01"E
TAMBO 1	A19		24	19'00"	146	58'00"E
WATER BORE 164	A4	X1	20	56'56"	144	11'40"E
WATER BORE 164	A4	Y1	20	56'56"	144	11'40"E
SPRINGSURE 13	A10		24	16'00"	147	10'00"E
CLAUDE BS 2	A41		24	22'25"	147	06'56"E
CLAUDE BS 1	A42		24	23'45"	147	12'58"E
BUCKLAND BS 1	A43		24	31'08"	147	21'45"E
BUCKLAND BS 2	A44		24	27'14"	147	33'22"E
CUNNO 1	A15	X1	25	06'55"	147	04'34"E
CUNNO 1	A15	Y1	25	06'55"	147	04'34"E
CUNNO 1	A15	Y2	25	06'55"	147	04'34"E
BALFOUR 1	A16	X1	25	12'13"	146	42'40"E
BALFOUR 1	A16	Y1	25	12'13"	146	42'40"E
VALETTA 1	A17		25	02'50"	146	16'00"E
WESTBOURNE 1	A18	X1	25	11'27"	146	08'02"E
WESTBOURNE 1	A18	Y1	25	11'27"	146	08'02"E
TAMBO 1-1A	A49		24	19'00"	146	36'00"E
HUGHENDEN 7	A5		20	52'00"	144	11'00"E
BIRKHEAD 1	A50		24	36'34"	146	23'27"E
ALLANDALE 1	A51	X1	24	25'00"	145	54'15"E
ALLANDALE 1	A51	Y1	24	25'00"	145	54'15"E
BARCOO 1	A52	X1	24	17'09"	145	08'18"E
BARCOO 1	A52	Y1	24	17'09"	145	08'18"E
FAIRLEA 1	A53	X1	24	29'50"	145	19'52"E
FAIRLEA 1	A53	Y1	24	29'50"	145	19'52"E
EASTWOOD 1	A54	X1	24	46'23"	145	20'56"E
EASTWOOD 1	A54	Y1	24	46'23"	145	20'56"E
BOREE 1	A55	X1	24	45'12"	145	14'36"E
BOREE 1	A55	Y1	24	45'12"	145	14'36"E
CARLOW 1	A56	X1	24	50'27"	145	25'48"E
CARLOW 1	A56	Y1	24	50'27"	145	25'48"E
CARLOW 1	A56	Y2	24	50'27"	145	25'48"E
RAVENSBOURNE 1	A57	X1	24	50'06"	145	37'08"E
RAVENSBOURNE 1	A57	Y1	24	50'06"	145	37'08"E
BONNIE 1	A58	X1	25	00'43"	145	22'01"E
BONNIE 1	A58	Y1	25	00'43"	145	22'01"E
BURY 1	A59	X1	25	02'40"	145	36'20"E
BURY 1	A59	Y1	25	02'40"	145	36'20"E
ROWEN LYNN 2	A6	X1	20	58'00"	143	15'00"E
ROWEN LYNN 2	A6	Y1	20	58'00"	143	15'00"E
ROWEN LYNN 2	A6	Y2	20	58'00"	143	15'00"E
ALVA 1	A60	X1	25	12'31"	145	23'14"E
ALVA 1	A60	Y1	25	12'31"	145	23'14"E
ALVA 1	A60	Y2	25	12'31"	145	23'14"E
STAFFORD 1	A61	X1	25	17'33"	145	26'03"E
STAFFORD 1	A61	Y1	25	17'33"	145	26'03"E
STAFFORD 1	A61	Y2	25	17'33"	145	26'03"E
ETONVALE 1	A62	X1	25	09'40"	144	59'40"E
ETONVALE 1	A62	Y1	25	09'40"	144	59'40"E
GREY RANGE 1	A63	X1	25	06'33"	144	37'22"E
GREY RANGE 1	A63	Y1	25	06'33"	144	37'22"E
COLLABARA 1	A64	X1	25	14'23"	144	45'00"E
COLLABARA 1	A64	Y1	25	14'23"	144	45'00"E
GILMORE 1	A65	X1	25	21'33"	144	48'38"E
GILMORE 1	A65	Y1	25	21'33"	144	48'38"E

YORGALA 1	A66	X1	25	30'19"141	55'48"E
YORGALA 1	A66	Y1	25	30'19"141	55'48"E
LEOPARDWOOD 1	A67	X1	25	37'10"144	40'13"E
LEOPARDWOOD 1	A67	Y1	25	37'10"144	40'13"E
DARTMOUTH 1	A68	X1	26	08'39"145	20'34"E
DARTMOUTH 1	A68	Y1	26	08'39"145	20'34"E
1515 DOWNS 1	A69		24	16'52"144	35'29"E
CORFIELD 1	A7	X1	21	42'46"143	22'30"E
CORFIELD 1	A7	Y1	21	42'46"143	22'30"E
CORFIELD 1	A7	Y2	21	42'46"143	22'30"E
BRYNDERWYN 1	A70		24	38'10"145	32'34"E
WESTON 1	A8	X1	22	02'20"142	16'39"E
WESTON 1	A8	Y1	22	02'20"142	16'39"E
WESTON 1	A8	Y2	22	02'20"142	16'39"E
LOVELLE DOWNS 1	A9	X1	22	12'38"142	11'06"E
LOVELLE DOWNS 1	A9	Y1	22	12'38"142	11'06"E
LOVELLE DOWNS 1	A9	Y2	22	12'38"142	11'06"E
STATE RESERVE 2, 26	B1		20	35'00"147	45'00"E
HILLALONG NS 1-4	B10		20	56'48"148	01'12"E
SPRINGSURE 11-18	B100		24	02'00"148	17'00"E
SPRINGSURE 18	B101Y1		24	02'00"148	17'00"E
SPRINGSURE 17	B102Y1		24	02'00"148	16'00"E
SPRINGSURE 16	B103Y1		24	03'00"148	14'00"E
DENISON NS 28	B106		24	06'45"149	24'33"E
ARCTURUS 1	B107X1		24	03'40"148	30'00"E
ARCTURUS 1	B107Y1		24	03'40"148	30'00"E
ARCTURUS 1	B107Y2		24	03'40"148	30'00"E
ARCTURUS 1	B107Y3		24	03'40"148	30'00"E
SHOTOVER 1	B108X1		23	57'36"149	08'16"E
SHOTOVER 1	B108Y1		23	57'36"149	08'16"E
STRUAN 1	B109X1		24	07'30"148	17'15"E
STRUAN 1	B109Y1		24	07'30"148	17'15"E
STRUAN 1	B109Y2		24	07'30"148	17'15"E
EXMOOR	B11		20	56'43"148	07'55"E
YANDINA 1	B110X1		24	11'00"148	30'00"E
YANDINA 1	B110Y1		24	11'00"148	30'00"E
YANDINA 1	B110Y2		24	11'00"148	30'00"E
DENISON NS 1	B111		24	14'20"148	29'20"E
SPRINGSURE 7-9	B112		24	16'00"148	14'00"E
INDERI 1	B113X1		24	17'00"148	29'00"E
INDERI 1	B113Y1		24	17'00"148	29'00"E
INDERI 1	B113Y2		24	17'00"148	29'00"E
INDERI 1	B113Y3		24	17'00"148	29'00"E
INDERI 1	B113Y4		24	17'00"148	29'00"E
SUNLIGHT 1	B114		24	16'60"148	51'15"E
SPRINGSURE 10	B116		24	25'00"148	10'00"E
SPRINGSURE 12	B117		24	25'00"147	57'00"E
SPRINGSURE 11	B118		24	31'00"147	58'00"E
SPRINGSURE 5	B119		24	34'00"148	23'00"E
BLENHEIM CREEK RJ4	B12		21	04'30"148	13'21"E
AOE 3 CONSUELO	B120		24	33'40"148	23'20"E
ROLLESTON 1	B121X1		24	33'47"148	37'52"E
ROLLESTON 1	B121Y1		24	33'47"148	37'52"E
ROLLESTON 1	B121Y2		24	33'47"148	37'52"E
ROLLESTON 1	B121Y3		24	33'47"148	37'52"E
PURBROOK 1	B122X1		24	37'10"148	48'20"E
PURBROOK 1	B122Y1		24	37'10"148	48'20"E
PURBROOK 1	B122Y2		24	37'10"148	48'20"E
PURBROOK 1	B122Y3		24	37'10"148	48'20"E
COMETSIDE 1	B123X1		24	39'00"148	48'00"E
COMETSIDE 1	B123Y1		24	39'00"148	48'00"E
COMETSIDE 1	B123Y2		24	39'00"148	48'00"E
SPRINGSURE 1-4	B124		24	39'00"148	28'00"E
SPRINGSURE 19	B126		24	41'16"148	08'26"E
BUCKLAND NS 1	B127		24	39'24"147	42'14"E
REIDS DOME 1	B128		24	47'25"148	19'18"E

PURBROOK SOUTH 1	B129X1	24 49'30"148	46'40"E
PURBROOK SOUTH 1	B129Y1	24 49'30"148	46'40"E
PURBROOK SOUTH 1	B129Y2	24 49'30"148	46'40"E
DOWER RIVER RJ7	B13	21 06'47"148	12'48"E
WARRITILLA NORTH 1	B130X1	24 52'49"148	31'50"E
WARRITILLA NORTH 1	B130Y1	24 52'49"148	31'50"E
WARRITILLA NORTH 1	B130Y2	24 52'49"148	31'50"E
WARRITILLA NORTH 1	B130Y3	24 52'49"148	31'50"E
CORDELO NS 2	B131	24 57'48"148	20'11"E
MORELLA 1	B132X1	25 01'00"148	29'00"E
MORELLA 1	B132Y1	25 01'00"148	29'00"E
MORELLA 1	B132Y2	25 01'00"148	29'00"E
BANDANNA 1	B133X1	25 06'40"148	17'20"E
BANDANNA 1	B133Y1	25 06'40"148	17'20"E
BANDANNA 1	B133Y2	25 06'40"148	17'20"E
BANDANNA 1	B133Y3	25 06'40"148	17'20"E
WARRITILLA 1	B134X1	25 06'49"148	33'14"E
WARRITILLA 1	B134Y1	25 06'49"148	33'14"E
WARRITILLA 1	B134Y2	25 06'49"148	33'14"E
WARRITILLA 1	B134Y3	25 06'49"148	33'14"E
TAROOM 10	B136Y1	25 13'00"148	47'00"E
TAROOM 10	B136Y2	25 13'00"148	47'00"E
AAO 7 ARCADIA	B137X1	25 17'53"148	47'43"E
AAO 7 ARCADIA	B137Y1	25 17'53"148	47'43"E
AAO 7 ARCADIA	B137Y2	25 17'53"148	47'43"E
AAO 7 ARCADIA	B137Y3	25 17'53"148	47'43"E
BARALABA 17	B138	24 06'29"149	57'36"E
DAWSON VALLEY MINE	B139	24 19'25"149	48'45"E
TURRAWALLA RJ5	B14	21 09'06"148	14'53"E
BANANA NS 57	B140	24 20'26"149	56'52"E
MUNGI NS 59	B141	24 26'00"150	00'22"E
MOURA NS 6	B142	24 30'15"150	03'08"E
MOURA 1	B143X1	24 31'30"149	56'30"E
MOURA 1	B143Y1	24 31'30"149	56'30"E
BANANA NS 1-8	B144Y1	24 42'45"150	04'10"E
BANANA NS 1-8	B144Y2	24 42'45"150	04'10"E
THEODORE NS 17	B146	24 52'31"150	01'42"E
D.R.D. 19	B147	24 59'00"150	03'00"E
MUNDUBBERA 5-8	B148	25 15'00"150	10'00"E
LIZZIE CREEK DC3	B16	21 11'05"148	18'11"E
HAZELWOOD CREEK DC1	B17	21 11'55"148	18'31"E
HILLALONG NS 5	B18	21 04'25"148	56'47"E
DRAKE NS 2	B19	21 05'59"147	54'49"E
BCCM NS 371	B2	20 34'12"147	50'17"E
DRAKE NS 24R	B20	21 13'34"147	50'14"E
DRAKE NS 7,8,10-12	B21	21 20'51"147	56'24"E
GROSVENOR NS 1-3,6	B22	21 31'08"147	59'30"E
WODENOUSE NS 4	B23	21 27'19"148	28'04"E
GROSVENOR NS 73	B24	21 38'17"147	59'00"E
MOUNT LANDSBOROUGH	B26	21 35'00"148	32'48"E
GROSVENOR NS 62	B27	21 42'55"148	01'02"E
GROSVENOR NS 12	B28	21 49'50"148	05'26"E
GROSVENOR NS 14	B29	21 50'27"148	00'50"E
DRAKE NS 19	B3	20 41'46"147	50'45"E
UTAH 13459	B30	21 51'19"147	59'41"E
GROSVENOR NS 49R	B31	21 56'08"148	00'02"E
GROSVENOR NS 44	B32	21 58'46"148	02'44"E
MOUNT FLORA	B33	21 51'00"148	34'15"E
RUGBY BORE	B34	22 06'29"147	50'22"E
O.K. BORE	B36	22 11'05"147	50'16"E
GROSVENOR NS 21	B37	22 06'47"148	05'20"E
CAIRNS COUNTY NS 16	B38	22 07'20"148	12'40"E
CAIRNS COUNTY NS 13	B39	22 09'03"148	09'29"E
GEBBIE CREEK	B4	20 44'23"147	56'57"E
CHERWELL CREEK	B40	22 13'39"147	58'33"E
CHERWELL BORE	B41 X1	22 19'36"147	58'21"E

CHERWELL BORE	B41	Y1	22	19'16"147	58'21"E
HARROW CREEK	B42		22	17'55"148	05'31"E
CAIRNS COUNTY NS 95	B43		22	13'15"148	18'07"E
CAIRNS COUNTY NS 11	B44		22	20'02"148	20'46"E
CAIRNS COUNTY NS 10	B46		22	21'02"148	19'02"E
CAIRNS COUNTY NS 7	B47		22	21'53"148	18'25"E
CAIRNS COUNTY NS 227	B48		22	24'55"148	24'05"E
CAIRNS COUNTY NS 69	B49		22	30'05"148	23'09"E
TAY GLEN 21/1-6	B50		22	31'01"148	19'17"E
CAIRNS COUNTY NS 99	B51		22	38'00"148	31'14"E
CAIRNS COUNTY NS 67	B52		22	40'32"148	30'27"E
BC.N18	B53		22	41'41"147	32'39"E
DMC BD1	B54		22	43'53"147	17'51"E
DMC DDH 10	B56		22	46'24"147	18'31"E
QUARRY HILL SHAFT	B57		22	49'48"147	19'03"E
DMC DDH 17	B58		22	55'32"147	41'53"E
CAPELLA EM 2/1-6	B59		23	06'28"147	48'51"E
WEST HAVILAH	B6		20	48'37"147	44'37"E
BOOROOHDARA 27/1	B60		22	50'53"148	29'42"E
ROPER NS 6	B61	X1	22	53'52"148	39'42"E
ROPER NS 6	B61	Y1	22	53'52"148	39'42"E
ROPER NS 3	B62	X1	22	57'36"148	42'44"E
ROPER NS 3	B62	Y1	22	57'36"148	42'44"E
BLACKWATER NS 193	B63		23	02'00"148	29'00"E
CAIRNS COUNTY NS 26	B64		23	07'31"148	28'05"E
TALBOT NS 48	B66		23	00'46"148	36'30"E
COOROORAH 1	B67	X1	23	07'30"148	42'40"E
COOROORAH 1	B67	Y1	23	07'30"148	42'40"E
COOROORAH 1	B67	Y2	23	07'30"148	42'40"E
COOROORAH 1	B67	Y3	23	07'30"148	42'40"E
COOROORAH 1	B67	Y4	23	07'30"148	42'40"E
TALBOT NS 6	B68		23	07'50"148	30'49"E
CAROA	B69		23	15'41"147	57'56"E
ROSELLA CREEK 1	B7		20	52'00"147	51'30"E
EMERALD NS 21	B70		23	15'10"148	18'07"E
EMERALD NS 1	B71		23	14'00"148	26'25"E
BLACKWATER NS 176	B72		23	13'40"148	36'10"E
EM 8 LEURA HILL	B73		23	10'05"149	34'05"E
EM 4 LEURA CREEK	B74		23	08'45"149	42'20"E
LEURA NS 31R	B76		23	18'11"148	52'02"E
BLACKWATER NS 9	B77		23	21'52"148	53'00"E
EMERALD NS 2	B78		23	21'55"148	26'27"E
BLACKWATER NS 191	B79		23	24'12"148	32'04"E
PARROT CREEK	B8		20	57'17"147	44'34"E
TALBOT NS 239	B80		23	27'29"148	29'16"E
DENISON NS 70	B81		23	30'49"148	13'04"E
DENISON NS31/38R/39R	B82		23	28'16"148	08'46"E
BURN MEADOWS EM 10	B83		23	29'44"147	57'47"E
NOGOA RIVER EM 6-8	B84		23	39'30"148	02'00"E
DENISON NS 22/24R	B86		23	37'46"148	10'57"E
DENISON NS 31/36R	B87		23	39'48"148	15'35"E
DENISON NS 53	B88		23	37'27"148	24'34"E
EMERALD NS 20	B89		23	35'47"148	26'35"E
DRAKE NS 20	B9		20	57'43"147	46'41"E
BLACKWATER NS 181	B90		23	31'15"148	10'00"E
BLACKWATER NS 112	B91		23	33'37"148	51'22"E
COMET 1	B92	X1	23	40'30"148	37'45"E
COMET 1	B92	Y1	23	40'30"148	37'45"E
COMET 1	B92	Y2	23	40'30"148	37'45"E
COMET 1	B92	Y3	23	40'30"148	37'45"E
BLACKWATER 1	B93		23	41'00"148	50'00"E
EMERALD NS 57	B94		23	49'49"148	30'34"E
DENISON NS 18	B96		23	50'33"148	18'32"E
DENISON NS 34	B97		23	48'34"147	59'03"E
DENISON NS 29	B98	X1	23	46'57"147	54'22"E
DENISON NS 29	B98	Y1	23	46'57"147	54'22"E

DENISON DS 25	B99		24 08'31"147	51'22"E
BARCOO JUNCTION 1	C1		25 03'41"143	02'12"E
ALKINA 1	C10		26 12'19"142	32'51"E
TANDAR 1	C11		26 05'22"141	55'30"E
GILPEPPEE 1	C12		26 25'25"141	33'17"E
GILPEPPEE 2	C13		26 26'54"141	36'05"E
BARROLKA EAST 1	C14		26 51'20"141	47'59"E
BARROLKA 1	C15		26 54'02"141	41'04"E
DURHAM DOWNS 1	C16		27 04'56"141	47'28"E
TARTULLA 1	C17		27 13'55"142	10'20"E
JACKSON 1	C18		27 16'16"142	25'12"E
ARRABURY 1	C19		27 11'35"141	04'50"E
BIDGERYGAR 1	C2		25 14'19"143	48'28"E
TALLALIA 1	C20		27 23'00"141	16'00"E
YANPURRA 1	C21		27 20'19"140	49'15"E
INNAMINCKA 1	C22		27 29'21"140	55'08"E
PACKSADDLE 1	C23		27 42'40"140	45'37"E
WIMMA 1	C24		27 21'10"140	11'16"E
LUDRICKE 1	C25		27 28'56"140	10'50"E
COONATTIE 1	C26		27 29'06"140	20'15"E
WAITANA 1	C27		27 37'59"140	25'33"E
BURLEY 1	C28		27 48'16"140	39'40"E
BROLGA 1	C29		27 35'36"140	01'28"E
TRURIDA 1	C3		25 29'30"143	28'28"E
FLY LAKE 4	C30		27 16'30"139	59'48"E
FLY LAKE 3	C31		27 39'45"139	56'21"E
TIRRAWARRA 10	C32		27 18'42"140	09'49"E
TIRRAWARRA 5	C33		27 42'11"140	07'23"E
MERRIMELIA 7	C34		27 44'48"140	10'12"E
KANOWANA 1	C35		27 47'57"139	58'42"E
WELCOME LAKE 1	C36		27 47'47"139	45'52"E
JACK LAKE 1	C37		27 56'37"139	49'18"E
GIDGEALPA 6	C38		27 55'24"140	02'39"E
GIDGEALPA 1	C39		27 56'46"140	04'56"E
INGELLA 1	C4		25 31'56"142	47'24"E
LAKE HOPE 1	C40	X1 28	07'22"139	38'10"E
WIRRARIE 1	C41	28	15'04"139	54'32"E
PANDO 2	C42	28	25'48"139	49'44"E
BOXWOOD 1	C43	28	31'24"139	50'43"E
WANCOOCHA 1	C44	28	31'45"139	59'03"E
MOOMBA 8	C45	28	06'44"140	07'47"E
MOOMBA 2	C46	28	10'56"140	13'36"E
BIG LAKE 1	C47	28	12'36"140	20'07"E
CORKWOOD 1	C48	28	01'10"140	48'11"E
DELLA 3	C49	28	03'54"140	40'46"E
CHANDOS 1	C5		25 50'14"143	19'36"E
DELLA 1	C50	28	06'34"140	40'25"E
BURKE 1	C51	28	07'43"140	57'19"E
DILCHEE 1	C52	28	12'38"140	55'26"E
STRZELECKI 1	C53	28	13'07"140	38'16"E
STRZELECKI 5	C54	28	14'28"140	38'45"E
MUDLALEE 1	C55	28	19'22"140	31'31"E
MURTEREE C-1	C56	28	25'01"140	23'14"E
MURTEREE 1	C57	28	23'47"140	34'24"E
MCKINLAY 1	C58	28	28'21"140	28'47"E
TOOLACHEE 5	C59	28	21'14"140	45'52"E
CHANDOS SOUTH 1	C6		25 57'02"143	22'00"E
TOOLACHEE EAST 1	C60	28	21'44"140	51'56"E
TOOLACHEE 6	C61	28	24'14"140	50'03"E
BRUMBY 1	C62	28	24'37"140	59'35"E
TOOLACHEE 1	C63	28	25'58"140	46'54"E
TIPAREE A-1	C64	28	30'10"140	38'20"E
MULGA 1	C65	28	39'35"140	31'50"E
KUMBARIE 1	C66	28	54'58"140	11'00"E
TINGA TINGANA 1	C67	29	00'45"140	05'38"E
WEENA 1	C68	29	05'38"139	50'51"E

CHERRI 1	C69	29 07'21"140 12'46"E
CONDROO 1	C7	26 11'40"141 22'47"E
CRIFFOS 1	C70	28 01'20"141 25'38"E
TICKALARA 1	C71	28 19'20"141 24'50"E
HOBE 1	C72	28 06'39"141 16'02"E
YANKO 1	C73	28 04'17"141 51'55"E
BODALLA 1	C8	26 25'41"141 26'09"E
MT. HOWITT 1	C9	26 17'27"142 23'17"E
TURRAWAN DDH 2A	G1	30 22'06"149 50'45"E
BOLGA DDH 1	G11	31 10'10"149 38'37"E
BANDO DDH 1	G12	31 10'15"149 51'50"E
GORAN DDH 1	G13	31 10'55"150 07'56"E
DIGBY DDH 1	G14	31 10'08"150 13'15"E
CURLEWIS DDH 1	G16	31 10'45"150 21'03"E
TEXAS DDH 1	G17	31 10'25"150 28'49"E
FERRIER DDH 2	G18	31 14'59"150 28'00"E
GURRADILLY DDH 1	G19	31 29'02"150 31'00"E
TULLAMULLEN DDH 1	G2	30 17'55"149 52'47"E
BOOMA DDH 1	G21	31 21'30"150 23'15"E
SPRINGFIELD DDH 1	G22	31 21'50"150 15'12"E
TRIBKEY DDH 1	G23	31 21'20"150 00'02"E
BOMEPA DDH 1	G24	31 23'47"149 52'51"E
WILSON DDH 1	G26	31 24'00"149 45'10"E
SALTWATER DDH 1	G27	31 30'15"149 45'45"E
NAPIER DDH 1	G28	31 36'40"149 45'26"E
QUEENSBOROUGH DDH 1	G29	31 45'20"149 41'45"E
WALLA WALLA DDH 1	G3	30 44'12"149 52'38"E
MT MARLOWE INLIER	G30	31 52'43"149 21'18"E
BOOYAMURNA DDH 1	G31	31 45'30"149 51'10"E
NANDOURA DDH 1	G32	32 02'45"149 46'55"E
CURRYALL DDH 1	G33	32 09'00"149 50'00"E
POGGY 1	G34	32 16'15"150 07'42"E
DUNEDOO	G35	32 01'46"149 19'13"E
BYLONG DDH 3	G36	32 21'37"150 06'10"E
BYLONG DDH 2	G37	32 28'23"150 08'14"E
BYLONG DDH 1	G38	32 32'00"150 01'10"E
GROWEE GULPH DDH 1	G39	32 41'41"150 06'06"E
DENISON DDH 1	G4	30 51'01"149 53'13"E
WIDDEN 2	G41	32 33'00"150 19'04"E
GOULBURN VALLEY DDH2	G42	32 25'12"150 19'50"E
BAERAMI CREEK DDH 2	G43	32 33'39"150 26'12"E
BAERAMI CREEK DDH 1	G44	32 28'33"150 29'19"E
GOULBURN VALLEY DDH1	G46	32 23'27"150 31'19"E
DOYLES CREEK DDH 10	G47	32 16'21"150 38'08"E
DENMAN DDH 1	G48	32 16'05"150 43'43"E
DOYLES CREEK DDH 14	G49	32 42'30"150 43'33"E
STRATHEARN DDH 1	G51	32 09'44"150 50'54"E
PARKVILLE 1	G52	31 56'00"150 49'00"E
WINGEN	G53	31 51'20"150 58'15"E
MURRURUNDI 1	G54	31 47'50"150 53'20"E
YARRARI DDH 1	G6	30 50'48"150 15'37"E
BENELABRI DDH 1	G7	30 57'45"150 00'20"E
COOGAL DDH 1	G8	30 57'30"149 52'25"E
BRIGALOW DDH 2	G9	30 57'07"149 38'33"E
WALOONA DDH 1	K1	34 51'28"145 42'21"E
YANCO SOUTH DDH 1	K2	35 00'33"145 43'09"E
OAKLANDS RDH 18	K3	35 25'22"145 50'08"E
OAKLANDS RDH 2	K4	35 27'13"145 59'00"E
OAKLANDS RDH 17	K5	35 28'23"146 04'34"E
OAKLANDS RDH 13	K6	35 38'04"146 05'34"E
OAKLANDS RDH 11	K7	35 40'17"146 03'35"E
MARINA 1	L1	14 38'10"143 52'30"E
BREEZA PLAINS 1	L2	14 44'20"143 55'07"E
LAKEFIELD 1	L3	14 53'44"143 59'01"E
MOUNT MULLIGAN	M1	16 49'40"144 49'40"E
ST. HELIERS BMR 1	S1	32 15'00"150 56'30"E

MARTINDALE 1A	S10	X1	32	30'48"150 37'00"E
MARTINDALE 1A	S10	Y1	32	30'48"150 37'00"E
MARTINDALE 1A	S10	Y2	32	30'48"150 37'00"E
BORE 37 (WOLLONGONG)	S100		34	17'18"150 45'56"E
BORE 32 (WOLLONGONG)	S101		34	15'18"150 36'25"E
BORE 5 (WOLLONGONG)	S102	X1	34	21'48"150 30'22"E
BORE 5 (WOLLONGONG)	S102	Y1	34	21'48"150 30'22"E
YERRINBOOL 1	S103	X1	34	23'18"150 31'18"E
YERRINBOOL 1	S103	Y1	34	23'18"150 31'18"E
BORE 81 (WOLLONGONG)	S104	X1	34	24'03"150 38'17"E
BORE 81 (WOLLONGONG)	S104	Y1	34	24'03"150 38'17"E
MOUNT KEMBLA 1	S107		34	27'10"150 51'40"E
MOUNT MURRAY 1	S108	X1	34	30'40"150 40'10"E
MOUNT MURRAY 1	S108	Y1	34	30'40"150 40'10"E
STOCKYARD MOUNTAIN 1	S109		34	35'41"150 46'53"E
DOYLES CREEK DDH 6	S11		32	30'58"150 47'34"E
BELANGLO 1A	S110	X1	34	32'44"150 16'26"E
BELANGLO 1A	S110	Y1	34	32'44"150 16'26'E
YARRUNGA CREEK	S111		34	44'36"150 22'21"E
GREENWELL POINT 2	S112		34	54'40"150 43'36"E
COONEMIA 1	S113	Y1	34	58'20"150 42'50"E
COONEMIA 1	S113	Y2	34	58'20"150 42'50"E
CALLALA DDH 1	S114		34	59'06"150 41'18"E
PT. PERPENDICULAR 1	S116	Y1	35	03'48"150 48'50"E
PT. PERPENDICULAR 1	S116	Y2	35	03'48"150 48'50"E
ULLADULLA 1	S117		35	09'12"150 43'35"E
WANDRAWANDIAN BORE	S118		35	03'08"150 29'20"E
TOMERONG-NERRIGA RD	S119		35	05'16"150 08'02"E
DOYLES CREEK DDH 2	S12		32	35'46"150 43'24"E
CLYDE RIVER	S120		35	11'36"150 15'33"E
JERRAWANGALA LOOKOUT	S121		35	10'33"150 22'14"E
POINTER GAP	S122		35	15'50"150 21'21"E
PIGEON HOUSE	S123		35	21'07"150 15'48"E
DURRAS-ULLADULLA	S124		35	22'00"150 29'22"E
DOYLES CREEK DDH 3	S13		32	34'52"150 48'38"E
JERRY PLAINS 1	S14	X1	32	28'29"150 56'24"E
JERRY PLAINS 1	S14	Y1	32	28'29"150 56'24"E
JERRY PLAINS 1	S14	Y2	32	28'29"150 56'24"E
DOYLES CREEK DDH 4	S16		32	32'20"150 55'51"E
CAMBERWELL 1	S17	Y1	32	32'30"151 06'09"E
CAMBERWELL 1	S17	Y2	32	32'30"151 06'09"E
SEDGEFIELD 1	S18	Y1	32	30'55"151 15'08"E
SEDGEFIELD 1	S18	Y2	32	30'55"151 15'08"E
CRANKY CORNER	S19		32	33'15"151 24'00"E
BLACK HILL DDH 1,3	S2		32	17'49"150 53'34"E
NEW MAIN COLLIERY	S20		32	31'45"151 24'00"E
LITTLE TABLE TOP	S21		32	31'15"151 26'00"E
GLOUCESTER BASIN	S22		32	07'15"151 56'30"E
MYALL SYNCLINE	S23		32	24'40"152 12'30"E
DOYLES CREEK DDH 11	S24		32	41'51"151 00'27"E
LODER 1	S26	X1	32	38'07"151 08'00"E
LODER 1	S26	Y1	32	38'07"151 08'00"E
BELFORD 1	S27	Y1	32	39'23"151 17'05"E
BELFORD 1	S27	Y2	32	39'23"151 17'05"E
GRETA DDH 1	S28		32	39'36"151 22'52"E
ALLANDALE	S29		32	42'00"151 25'03"E
SAVOY DDH 2	S3		32	20'15"150 57'30"E
LOCHINVAR	S30		32	43'30"151 25'20"E
GARRETTS TUNNEL	S31		32	41'54"151 48'22"E
DUCKHOLE BORE 1	S32		32	47'00"151 49'15"E
STOCKTON DDH 3	S33		32	50'41"151 46'10"E
EAST MAITLAND 1	S34	X1	32	45'47"151 37'05"E
EAST MAITLAND 1	S34	Y1	32	45'47"151 37'05"E
EAST MAITLAND 1	S34	Y2	32	45'47"151 37'05"E
GOSFORTH	S36		32	42'17"151 28'48"E
IRONBARK BRUSH 2	S37		32	49'25"151 37'15"E

CESSNOCK DDH 1	S38		32	52'42"151 23'38"E
HILLFIELD 1	S39		32	52'39"151 12'27"E
BAYSWATER 2 OPEN CUT	S4		32	21'00"150 54'00"E
DOYLES CREEK DDH 9	S40		32	47'10"151 06'13"E
MT. HURWIN 1	S41	Y1	32	50'45"150 55'20"E
MT. HURWIN 1	S41	Y2	32	50'45"150 55'20"E
HOWES VALLEY DDH 1	S42		32	52'31"150 48'37"E
KELGOOLA DDH 3	S43	X1	32	54'15"150 18'45"E
GLEN DAVIS P.O.	S44		33	07'55"150 16'35"E
MELLONG 1	S46		33	00'25"150 41'36"E
HOWES SWAMP 1	S47	X1	33	07'58"150 41'37"E
HOWES SWAMP 1	S47	Y1	33	07'58"150 41'37"E
HOWES SWAMP 1	S47	Y2	33	07'58"150 41'37"E
HIGHER MACDONALD 1	S48		33	12'55"150 55'53"E
MURRAYS RUN DDH 1	S49		33	06'25"151 11'12"E
KULNURA 1	S50		33	12'54"151 11'50"E
BRUSH CREEK DDH	S51		33	09'17"151 15'50"E
DOORALONG DDH 1	S52		33	11'50"151 21'27"E
JILLIBY CREEK DDH 1	S53		33	07'51"151 21'27"E
COORAMBONG DDH 1	S54		33	04'19"151 26'14"E
DOGGY CREEK DDH 1	S56		32	59'20"151 30'24"E
A.A. CO.'S DEEP BORES	S57	Y1	32	55'50"151 46'07"E
A.A. CO.'S DEEP BORES	S57	Y2	32	55'50"151 46'07"E
TORONTO	S58		33	00'42"151 35'29"E
MORISSET 4	S59		33	03'40"151 30'47"E
BAYSWATER BMR 1	S6		32	23'40"151 01'55"E
SOUTH WALLARAH 5	S60		33	11'15"151 31'03"E
WYEE BORE	S61		33	12'10"151 29'26"E
LAKE MUNMORAH 2	S62		33	11'21"151 36'43"E
BUNGARSE MORAH	S63		33	16'28"151 33'52"E
TERRIGAL 1-1A	S64		33	26'32"151 25'56"E
LOWER PORTLAND 1	S66		33	26'00"150 51'45"E
UPPER COLO DDH 1	S67	X1	33	25'21"150 44'11"E
UPPER COLO DDH 1	S67	Y1	33	25'21"150 44'11"E
KURRAJONG HEIGHTS 1	S68	X1	33	31'45"150 37'15"E
KURRAJONG HEIGHTS 1	S68	Y1	33	31'45"150 37'15"E
KURRAJONG HEIGHTS 1	S68	Y2	33	31'45"150 37'15"E
BIRDS ROCK 22	S69		33	23'15"150 16'59"E
JERRYS PLAINS DDH 6	S7		32	23'20"150 46'04"E
LITHGOW NEWNES 31	S70		33	19'34"150 09'41"E
BROWNS GAP	S71		33	30'00"150 10'00"E
WALFORD GULLY	S72		33	37'36"150 21'33"E
WOODFORD DDH 1	S73	Y1	33	44'21"150 24'48"E
WOODFORD DDH 1	S73	Y2	33	44'21"150 24'48"E
KEDUMBA CREEK	S74		33	46'40"150 22'30"E
BEDFORD CREEK BORE	S76	Y1	33	47'29"150 28'11"E
BEDFORD CREEK BORE	S76	Y2	33	47'29"150 28'11"E
MULGOA 2	S77		33	48'40"150 38'27"E
CAMDEN 8	S78		33	52'56"150 44'15"E
LEEHOME 1	S79		33	48'59"150 44'45"E
JERRYS PLAINS DDH 8	S8		32	25'41"150 44'00"E
BERKSHIRE PARK 1	S80		33	46'53"150 47'27"E
KENTHURST 1	S81		33	40'09"150 59'12"E
DURAL SOUTH 1	S82	X1	33	42'37"151 01'02"E
DURAL SOUTH 1	S82	Y1	33	42'37"151 01'02"E
DURAL SOUTH 1	S82	Y2	33	42'37"151 01'02"E
WINDEYERS HAWKES. R	S83		33	33'17"151 15'04"E
NARRABEEN	S84		33	42'49"151 16'32"E
BALMAIN SHAFTS, BORES	S86		33	51'05"151 10'51"E
FAIRFIELD 1	S87		33	52'16"150 54'54"E
CAPE BANKS DDH 1	S88		33	59'26"151 15'05"E
LIVERPOOL-MOOREBANK	S89		33	58'55"150 54'45"E
DENMAN DDH 7	S9		32	27'51"150 39'58"E
BURRAGORANG 101	S90		34	00'14"150 16'52"E
MT. HUNTER 1	S91	Y1	34	03'30"150 38'50"E
MT. HUNTER 1	S91	Y2	34	03'30"150 38'50"E

KIRKHAM 1	S92	Y1	34	01'39"150	42'27"E
KIRKHAM 1	S92	Y2	34	01'39"150	42'27"E
BADGELLY 1	S93		34	02'42"150	47'41"E
BORE 72 (CAMDEN)	S94		34	05'47"150	52'27"E
BORE 75 (CAMDEN)	S96		34	05'32"150	59'14"E
NATIONAL PARK (SC)	S97		34	07'11"151	00'20"E
WORONORA 1	S98	X1	34	11'40"150	54'56"E
WORONORA 1	S98	Y1	34	11'40"150	54'56"E
WORONORA 1	S98	Y2	34	11'40"150	54'56"E
CATARACT 1	S99	X1	34	19'00"150	53'00"E
CATARACT 1	S99	Y1	34	19'00"150	53'00"E
WARRONG 1	T1	Y1	25	09'46"147	53'37"E
WARRONG 1	T1	Y2	25	09'46"147	53'37"E
WARRONG 1	T1	Y3	25	09'46"147	53'37"E
WOMBLEBANK 1	T10	X1	25	47'35"148	11'35"E
WOMBLEBANK 1	T10	Y1	25	47'35"148	11'35"E
WOMBLEBANK 1	T10	Y2	25	47'35"148	11'35"E
WOMBLEBANK 1	T10	Y3	25	47'35"148	11'35"E
TOOLOOMBILLA 1	T11		25	53'40"147	57'46"E
KILLORAN 1	T12	Y1	25	54'00"148	19'00"E
KILLORAN 1	T12	Y2	25	54'00"148	19'00"E
KILLORAN 1	T12	Y3	25	54'00"148	19'00"E
GLENHAUGHTON 1	T13	X1	25	12'30"149	07'45"E
GLENHAUGHTON 1	T13	Y1	25	12'30"149	07'45"E
GLENHAUGHTON 1	T13	Y2	25	12'30"149	07'45"E
GLENHAUGHTON 1	T13	Y3	25	12'30"149	07'45"E
COCKATOO CREEK 1	T14	X1	25	34'16"150	06'00"E
COCKATOO CREEK 1	T14	Y1	25	34'16"150	06'00"E
COCKATOO CREEK 1	T14	Y2	25	34'16"150	06'00"E
COCKATOO CREEK 1	T14	Y3	25	34'16"150	06'00"E
D.R.D. 6	T15		25	40'55"150	06'45"E
BURUNGA 1	T16	X1	26	00'00"150	04'43"E
BURUNGA 1	T16	Y1	26	00'00"150	04'43"E
BURUNGA 1	T16	Y2	26	00'00"150	04'43"E
BURUNGA 1	T16	Y3	26	00'00"150	04'43"E
WANDOAN 1	T17	X1	26	10'31"149	54'21"E
WANDOAN 1	T17	Y1	26	10'31"149	54'21"E
MEELEEBEE 1	T18	X1	26	11'00"149	12'00"E
MEELEEBEE 1	T18	Y1	26	11'00"149	12'00"E
ARBROATH 1	T19	X1	26	41'00"148	28'00"E
ARBROATH 1	T19	Y1	26	41'00"148	28'00"E
EDDYSTONE 1	T2	X1	25	20'00"148	18'00"E
EDDYSTONE 1	T2	Y1	25	20'00"148	18'00"E
EDDYSTONE 1	T2	Y2	25	20'00"148	18'00"E
SIX MILE 1	T20	X1	26	39'40"149	04'20"E
SIX MILE 1	T20	Y1	26	39'40"149	04'20"E
SILVER VALLEY 1	T21	X1	26	43'36"149	15'51"E
SILVER VALLEY 1	T21	Y1	26	43'36"149	15'51"E
COMBARNGO 1	T22	X1	26	51'00"149	09'00"E
COMBARNGO 1	T22	Y1	26	51'00"149	09'00"E
APPLE TREE 1	T23	X1	26	54'17"149	16'03"E
APPLE TREE 1	T23	Y1	26	54'17"149	16'03"E
MONCLOVA 1	T24		27	00'35"148	57'12"E
MYALL CREEK 1	T25	X1	27	04'47"149	12'11"E
MYALL CREEK 1	T25	Y1	27	04'47"149	12'11"E
WERIBONE 1	T26		27	19'38"149	21'02"E
LYNROCK 1	T27		27	26'08"149	09'55"E
TEY 1	T28	X1	27	08'37"150	13'31"E
TEY 1	T28	Y1	27	08'37"150	13'31"E
LAWSON 1	T29		27	06'56"150	24'59"E
CRYSTALBROOK 1	T3		25	29'03"147	59'35"E
UNDULLA 1	T30	X1	27	13'40"150	16'04"E
UNDULLA 1	T30	Y1	27	13'40"150	16'04"E
TARA 1	T31	X1	27	20'50"150	29'26"E
TARA 1	T31	Y1	27	20'50"150	29'26"E
PAGET 1	T32		27	27'46"150	31'31"E

CABAWIN 1	T33	X1	27	29'46"150	11'22"E
CABAWIN 1	T33	Y1	27	29'46"150	11'22"E
MOONIE 1	T34	X1	27	44'54"150	15'25"E
MOONIE 1	T34	Y1	27	44'54"150	15'25"E
WEIR 1	T35		27	51'52"150	25'11"E
BOOROONDOO 1	T36		27	52'20"150	21'23"E
WARRIGABLE 1	T37		27	56'45"150	15'37"E
YARRILL CREEK 1	T38	X1	28	04'42"150	25'16"E
YARRILL CREEK 1	T38	Y1	28	04'42"150	25'16"E
FLINTON 1	T39	X1	27	54'52"149	40'10"E
FLINTON 1	T39	Y1	27	54'52"149	40'10"E
WESTGROVE 3	T4	X1	25	34'00"148	26'00"E
WESTGROVE 3	T4	Y1	25	34'00"148	26'00"E
WESTGROVE 3	T4	Y2	25	34'00"148	26'00"E
WESTGROVE 3	T4	Y3	25	34'00"148	26'00"E
WESTGROVE 3	T4	Y4	25	34'00"148	26'00"E
ALTON 1	T40	X1	27	56'18"149	22'18"E
ALTON 1	T40	Y1	27	56'18"149	22'18"E
KENTUCKY 1	T41	X1	28	01'31"149	18'58"E
KENTUCKY 1	T41	Y1	28	01'31"149	18'58"E
ULA ULA 1	T42	X1	28	05'05"149	26'41"E
ULA ULA 1	T42	Y1	28	05'05"149	26'41"E
MINIMA 1	T43	X1	28	21'33"150	07'00"E
MINIMA 1	T43	Y1	28	21'33"150	07'00"E
TINGAN 1	T44	X1	28	25'07"150	15'12"E
TINGAN 1	T44	Y1	28	25'07"150	15'12"E
BOOBERAINNA 1	T45	X1	28	27'54"149	48'29"E
BOOBERAINNA 1	T45	Y1	28	27'54"149	48'29"E
MACINTYRE 1	T46		28	37'10"149	51'00"E
GOONDIWINDI 1	T47	X1	28	38'25"150	11'28"E
GOONDIWINDI 1	T47	Y1	28	38'25"150	11'28"E
LIMEBON 1	T48	X1	28	49'06"150	03'47"E
LIMEBON 1	T48	Y1	28	49'06"150	03'47"E
WERRINA 2	T49	X1	28	47'49"149	24'00"E
WERRINA 2	T49	Y1	28	47'49"149	24'00"E
KILDARE NORTH 1	T5	X1	25	40'43"148	22'33"E
KILDARE NORTH 1	T5	Y1	25	40'43"148	22'33"E
KILDARE NORTH 1	T5	Y2	25	40'43"148	22'30"E
GARAH 1	T50		29	02'16"149	43'39"E
GIL GIL 1	T51	X1	29	11'23"149	52'37"E
GIL GIL 1	T51	Y1	29	11'23"149	52'37"E
MT. PLEASANT 1	T52	X1	29	10'06"150	03'49"E
MT. PLEASANT 1	T52	Y1	29	10'06"150	03'49"E
KIA ORA 1	T6	X1	25	39'00"148	37'00"E
KIA ORA 1	T6	Y1	25	39'00"148	37'00"E
KIA ORA 1	T6	Y2	25	39'00"148	37'00"E
TAROOM 11-11A	T7		25	42'00"148	42'00"E
TAROOM 12-12A	T8		25	48'00"148	31'00"E
GLENTULLOCH 1	T9	X1	25	47'17"148	22'47"E
GLENTULLOCH 1	T9	Y1	25	47'17"148	22'47"E
GLENTULLOCH 1	T9	Y2	25	47'17"148	22'47"E
GLENTULLOCH 1	T9	Y3	25	47'17"148	22'47"E
GLENTULLOCH 1	T9	Y4	25	47'17"148	22'47"E

KEY TO REFERENCE NUMBERS

A1		CHARTERS TOWERS 1	GALILEE
A10	X1	GOLEBURRA 1	GALILEE
A10	Y1	GOLEBURRA 1	GALILEE
A11	X1	GORGONGO 1	GALILEE
A11	Y1	GORGONGO 1	GALILEE
A12	X1	TOWERHILL A-1	GALILEE
A12	Y1	TOWERHILL A-1	GALILEE
A12	Y2	TOWERHILL A-1	GALILEE
A13	X1	KOBURRA 1	GALILEE
A13	Y1	KOBURRA 1	GALILEE
A13	Y2	KOBURRA 1	GALILEE
A14	X1	GALILEE NS 33	GALILEE
A14	Y1	GALILEE NS 33	GALILEE
A15	X1	GALILEE NS 24	GALILEE
A15	Y1	GALILEE NS 24	GALILEE
A16	X1	GALILEE NS 29	GALILEE
A16	Y1	GALILEE NS 29	GALILEE
A17	X1	GALILEE NS 21	GALILEE
A17	Y1	GALILEE NS 21	GALILEE
A18	X1	LAKE GALILEE 1	GALILEE
A18	Y1	LAKE GALILEE 1	GALILEE
A18	Y2	LAKE GALILEE 1	GALILEE
A19	X1	GALILEE NS 10,8	GALILEE
A19	Y1	GALILEE NS 10,8	GALILEE
A2		HUGHENDEN 3-4R	GALILEE
A20	X1	GALILEE NS 5	GALILEE
A20	Y1	GALILEE NS 5	GALILEE
A21	X1	HEXHAM 1	GALILEE
A21	Y1	HEXHAM 1	GALILEE
A22	X1	ARAMAC 1	GALILEE
A22	Y1	ARAMAC 1	GALILEE
A23	X1	THUNDERBOLT 1	GALILEE
A23	Y1	THUNDERBOLT 1	GALILEE
A23	Y2	THUNDERBOLT 1	GALILEE
A24	X1	BERYL 1	GALILEE
A24	Y1	BERYL 1	GALILEE
A24	Y2	BERYL 1	GALILEE
A25	X1	BROOKWOOD 1	GALILEE
A25	Y1	BROOKWOOD 1	GALILEE
A25	Y2	BROOKWOOD 1	GALILEE
A26	X1	MUTTABURRA 1	GALILEE
A26	Y1	MUTTABURRA 1	GALILEE
A26	Y2	MUTTABURRA 1	GALILEE
A27	X1	GLENARAS 1	GALILEE
A27	Y1	GLENARAS 1	GALILEE
A27	Y2	GLENARAS 1	GALILEE
A28	X1	RAND 1	GALILEE
A28	Y1	RAND 1	GALILEE
A28	Y2	RAND 1	GALILEE
A29	X1	MARCHMONT 1	GALILEE
A29	Y1	MARCHMONT 1	GALILEE
A29	Y2	MARCHMONT 1	GALILEE
A3		HUGHENDEN 6	GALILEE
A30	X1	SALTERN CREEK 1	GALILEE
A30	Y1	SALTERN CREEK 1	GALILEE
A30	Y2	SALTERN CREEK 1	GALILEE
A31	X1	HULTON 1	GALILEE
A31	Y1	HULTON 1	GALILEE
A31	Y2	HULTON 1	GALILEE
A32	X1	MARANDA 1	GALILEE
A32	Y1	MARANDA 1	GALILEE
A32	Y2	MARANDA 1	GALILEE
A33	X1	COREENA 1	GALILEE
A33	Y1	COREENA 1	GALILEE

A33	Y2	COREENA 1	GALILEE
A34	X1	ALICE RIVER 1	GALILEE
A34	Y1	ALICE RIVER 1	GALILEE
A34	Y3	ALICE RIVER 1	GALILEE
A35	X1	GALILEE NS 1,2	GALILEE
A35	Y1	GALILEE NS 1,2	GALILEE
A36	X1	GALILEE NS 15R	GALILEE
A36	Y1	GALILEE NS 15R	GALILEE
A37		GSQ JERICHO 1	GALILEE
A38	X1	AOD JERICHO 1	GALILEE
A38	Y1	AOD JERICHO 1	GALILEE
A39		TAMBO 3	GALILEE
A4	X1	WATER BORE 364	GALILEE
A4	Y1	WATER BORE 364	GALILEE
A40		SPRINGSURE 13	GALILEE
A41		CLAUDE NS 2	GALILEE
A42		CLAUDE NS 1	GALILEE
A43		BUCKLAND NS 3	GALILEE
A44		BUCKLAND NS 2	GALILEE
A45	X1	CUNNO 1	GALILEE
A45	Y1	CUNNO 1	GALILEE
A45	Y2	CUNNO 1	GALILEE
A46	X1	BALFOUR 1	GALILEE
A46	Y1	BALFOUR 1	GALILEE
A47		VALETTA 1	GALILEE
A48	X1	WESTBOURNE 1	GALILEE
A48	Y1	WESTBOURNE 1	GALILEE
A49		TAMBO 1-1A	GALILEE
A5		HUGHENDEN 7	GALILEE
A50		BIRKHEAD 1	GALILEE
A51	X1	ALLANDALE 1	GALILEE
A51	Y1	ALLANDALE 1	GALILEE
A52	X1	BARCOO 1	GALILEE
A52	Y1	BARCOO 1	GALILEE
A53	X1	FAIRLEA 1	GALILEE
A53	Y1	FAIRLEA 1	GALILEE
A54	X1	EASTWOOD 1	GALILEE
A54	Y1	EASTWOOD 1	GALILEE
A55	X1	BOREE 1	GALILEE
A55	Y1	BOREE 1	GALILEE
A56	X1	CARLOW 1	GALILEE
A56	Y1	CARLOW 1	GALILEE
A56	Y2	CARLOW 1	GALILEE
A57	X1	RAVENSBOURNE 1	GALILEE
A57	Y1	RAVENSBOURNE 1	GALILEE
A58	X1	BONNIE 1	GALILEE
A58	Y1	BONNIE 1	GALILEE
A59	X1	BURY 1	GALILEE
A59	Y1	BURY 1	GALILEE
A6	X1	ROWEN LYNN 2	GALILEE
A6	Y1	ROWEN LYNN 2	GALILEE
A6	Y2	ROWEN LYNN 2	GALILEE
A60	X1	ALVA 1	GALILEE
A60	Y1	ALVA 1	GALILEE
A60	Y2	ALVA 1	GALILEE
A61	X1	STAFFORD 1	GALILEE
A61	Y1	STAFFORD 1	GALILEE
A61	Y2	STAFFORD 1	GALILEE
A62	X1	ETONVALE 1	GALILEE
A62	Y1	ETONVALE 1	GALILEE
A63	X1	GREY RANGE 1	GALILEE
A63	Y1	GREY RANGE 1	GALILEE
A64	X1	COLLABARA 1	GALILEE
A64	Y1	COLLABARA 1	GALILEE
A65	X1	GILMORE 1	GALILEE
A65	Y1	GILMORE 1	GALILEE

AG6 X1	YONGALA 1	GALILEE
AG6 Y1	YONGALA 1	GALILEE
AG7 X1	LEOPARDWOOD 1	GALILEE
AG7 Y1	LEOPARDWOOD 1	GALILEE
AG8 X1	DARTMOUTH 1	GALILEE
AG8 Y1	DARTMOUTH 1	GALILEE
AG9	ISTS DOWNS 1	GALILEE
A7 X1	CORFIELD 1	GALILEE
A7 Y1	CORFIELD 1	GALILEE
A7 Y2	CORFIELD 1	GALILEE
A70	BRYNDERWYN 1	GALILEE
A8 X1	WESTON 1	GALILEE
A8 Y1	WESTON 1	GALILEE
A8 Y2	WESTON 1	GALILEE
A9 X1	LOVELLE DOWNS 1	GALILEE
A9 Y1	LOVELLE DOWNS 1	GALILEE
A9 Y2	LOVELLE DOWNS 1	GALILEE
B1	STATE RESERVE 2, 26	BOWEN, NORTH
B10	HILLALONG NS 1-4	BOWEN, NORTH
B100	SPRINGSURE 14-18	BOWEN, SOUTH-WEST
B101Y1	SPRINGSURE 18	BOWEN, SOUTH-WEST
B102Y1	SPRINGSURE 17	BOWEN, SOUTH-WEST
B103Y1	SPRINGSURE 16	BOWEN, SOUTH-WEST
B106	DENISON NS 28	BOWEN, SOUTH-WEST
B107X1	ARCTURUS 1	BOWEN, SOUTH-WEST
B107Y1	ARCTURUS 1	BOWEN, SOUTH-WEST
B107Y2	ARCTURUS 1	BOWEN, SOUTH-WEST
B107Y3	ARCTURUS 1	BOWEN, SOUTH-WEST
B108X1	SHOTOVER 1	BOWEN, CENTRAL
B108Y1	SHOTOVER 1	BOWEN, CENTRAL
B109X1	STRUAN 1	BOWEN, SOUTH-WEST
B109Y1	STRUAN 1	BOWEN, SOUTH-WEST
B109Y2	STRUAN 1	BOWEN, SOUTH-WEST
B11	EXMOOR	BOWEN, NORTH
B110X1	YANDINA 1	BOWEN, SOUTH-WEST
B110Y1	YANDINA 1	BOWEN, SOUTH-WEST
B110Y2	YANDINA 1	BOWEN, SOUTH-WEST
B111	DENISON NS 1	BOWEN, SOUTH-WEST
B112	SPRINGSURE 7-9	BOWEN, SOUTH-WEST
B113X1	INDERI 1	BOWEN, SOUTH-WEST
B113Y1	INDERI 1	BOWEN, SOUTH-WEST
B113Y2	INDERI 1	BOWEN, SOUTH-WEST
B113Y3	INDERI 1	BOWEN, SOUTH-WEST
B113Y4	INDERI 1	BOWEN, SOUTH-WEST
B114	SUNLIGHT 1	BOWEN, SOUTH-WEST
B116	SPRINGSURE 10	BOWEN, SOUTH-WEST
B117	SPRINGSURE 12	BOWEN, SOUTH-WEST
B118	SPRINGSURE 11	BOWEN, SOUTH-WEST
B119	SPRINGSURE 5	BOWEN, SOUTH-WEST
B12	BLENHEIM CREEK RS4	BOWEN, NORTH
B120	AOE 3 CONSUELO	BOWEN, SOUTH-WEST
B121X1	ROLLESTON 1	BOWEN, SOUTH-WEST
B121Y1	ROLLESTON 1	BOWEN, SOUTH-WEST
B121Y2	ROLLESTON 1	BOWEN, SOUTH-WEST
B121Y3	ROLLESTON 1	BOWEN, SOUTH-WEST
B122X1	PURBROOK 1	BOWEN, SOUTH-WEST
B122Y1	PURBROOK 1	BOWEN, SOUTH-WEST
B122Y2	PURBROOK 1	BOWEN, SOUTH-WEST
B122Y3	PURBROOK 1	BOWEN, SOUTH-WEST
B123X1	COMETSIDE 1	BOWEN, SOUTH-WEST
B123Y1	COMETSIDE 1	BOWEN, SOUTH-WEST
B123Y2	COMETSIDE 1	BOWEN, SOUTH-WEST
B124	SPRINGSURE 1-4	BOWEN, SOUTH-WEST
B126	SPRINGSURE 19	BOWEN, SOUTH-WEST
B127	BUCKLAND NS 1	BOWEN, SOUTH-WEST
B128	REIDS DOME 1	BOWEN, SOUTH-WEST

B129X1	FURBROOK SOUTH 1	BOWEN, SOUTH-WEST
B129Y1	FURBROOK SOUTH 1	BOWEN, SOUTH-WEST
B129Y2	FURBROOK SOUTH 1	BOWEN, SOUTH-WEST
B13	BOWEN RIVER RJ7	BOWEN, NORTH
B130X1	WARRINILLA NORTH 1	BOWEN, SOUTH-WEST
B130Y1	WARRINILLA NORTH 1	BOWEN, SOUTH-WEST
B130Y2	WARRINILLA NORTH 1	BOWEN, SOUTH-WEST
B130Y3	WARRINILLA NORTH 1	BOWEN, SOUTH-WEST
B131	CONSUELO NS 2	BOWEN, SOUTH-WEST
B132X1	MORELLA 1	BOWEN, SOUTH-WEST
B132Y1	MORELLA 1	BOWEN, SOUTH-WEST
B132Y2	MORELLA 1	BOWEN, SOUTH-WEST
B133X1	BANDANNA 1	BOWEN, SOUTH-WEST
B133Y1	BANDANNA 1	BOWEN, SOUTH-WEST
B133Y2	BANDANNA 1	BOWEN, SOUTH-WEST
B133Y3	BANDANNA 1	BOWEN, SOUTH-WEST
B134X1	WARRINILLA 1	BOWEN, SOUTH-WEST
B134Y1	WARRINILLA 1	BOWEN, SOUTH-WEST
B134Y2	WARRINILLA 1	BOWEN, SOUTH-WEST
B134Y3	WARRINILLA 1	BOWEN, SOUTH-WEST
B136Y1	TAROOM 10	BOWEN, SOUTH-WEST
B136Y2	TAROOM 10	BOWEN, SOUTH-WEST
B137X1	AAO 7 ARCADIA	BOWEN, SOUTH-WEST
B137Y1	AAO 7 ARCADIA	BOWEN, SOUTH-WEST
B137Y2	AAO 7 ARCADIA	BOWEN, SOUTH-WEST
B137Y3	AAO 7 ARCADIA	BOWEN, SOUTH-WEST
B138	BARALABA 17	BOWEN, SOUTH-EAST
B139	DAWSON VALLEY MINE	BOWEN, SOUTH-EAST
B14	TURRAWALLA RJ5	BOWEN, NORTH
B140	BANANA NS 57	BOWEN, SOUTH-EAST
B141	MUNGI NS 59	BOWEN, SOUTH-EAST
B142	MOURA NS 6	BOWEN, SOUTH-EAST
B143X1	MOURA 1	BOWEN, SOUTH-EAST
B143Y1	MOURA 1	BOWEN, SOUTH-EAST
B144Y1	BANANA NS 1-8	BOWEN, SOUTH-EAST
B144Y2	BANANA NS 1-8	BOWEN, SOUTH-EAST
B146	THEODORE NS 37	BOWEN, SOUTH-EAST
B147	D.R.D. 19	BOWEN, SOUTH-EAST
B148	MUNDUBBERA 5-8	BOWEN, SOUTH-EAST
B16	LIZZIE CREEK DC3	BOWEN, NORTH
B17	HAZELWOOD CREEK DC1	BOWEN, NORTH
B18	HILLALONG NS 5	CALEN
B19	DRAKE NS 2	BOWEN, NORTH
B2	BCCM NS 371	BOWEN, NORTH
B20	DRAKE NS 24R	BOWEN, NORTH
B21	DRAKE NS 7,8,10,12	BOWEN, NORTH
B22	GROSVENOR NS 1-3,6	BOWEN, NORTH
B23	WODEHOUSE NS 4	BOWEN, NORTH
B24	GROSVENOR NS 73	BOWEN, NORTH
B26	MOUNT LANDSBOROUGH	BOWEN, NORTH
B27	GROSVENOR NS 62	BOWEN, NORTH
B28	GROSVENOR NS 12	BOWEN, NORTH
B29	GROSVENOR NS 14	BOWEN, NORTH
B3	DRAKE NS 19	BOWEN, NORTH
B30	UTAH 13459	BOWEN, NORTH
B31	GROSVENOR NS 49R	BOWEN, NORTH
B32	GROSVENOR NS 44	BOWEN, NORTH
B33	MOUNT FLORA	BOWEN, NORTH
B34	RUGBY BORE	BOWEN, NORTH
B36	O.K. BORE	BOWEN, NORTH
B37	GROSVENOR NS 23	BOWEN, NORTH
B38	CAIRNS COUNTY NS 16	BOWEN, NORTH
B39	CAIRNS COUNTY NS 13	BOWEN, NORTH
B4	GEBBIE CREEK	BOWEN, NORTH
B40	CHERWELL CREEK	BOWEN, NORTH
B41 X1	CHERWELL BORE	BOWEN, NORTH

B41	Y1	CHERWELL BORE	BOWEN, NORTH
B42		HARROW CREEK	BOWEN, NORTH
B43		CAIRNS COUNTY NS 95	BOWEN, NORTH
B44		CAIRNS COUNTY NS 11	BOWEN, NORTH
B46		CAIRNS COUNTY NS 10	BOWEN, NORTH
B47		CAIRNS COUNTY NS 7	BOWEN, NORTH
B48		CAIRNS COUNTY NS 227	BOWEN, NORTH
B49		CAIRNS COUNTY NS 69	BOWEN, NORTH
B50		TAY GLEN 21/1-6	BOWEN, NORTH
B51		CAIRNS COUNTY NS 99	BOWEN, NORTH
B52		CAIRNS COUNTY NS 67	BOWEN, NORTH
B53		BC.N18	BOWEN NORTH: BLAIR ATHOL
B54		DMC BD1	BOWEN, NORTH: WOLFANG
B56		DMC DDH 10	BOWEN, NORTH
B57		QUARRY HILL SHAFT	BOWEN, NORTH
B58		DMC DDH 37	BOWEN, NORTH: KARIN
B59		CAPELLA EM 2/1-6	BOWEN, SOUTH-WEST
B6		WEST HAVILAH	BOWEN, NORTH
B60		BOOROONDARA 27/1	BOWEN, NORTH
B61	X1	ROPER NS 6	BOWEN, NORTH
B61	Y1	ROPER NS 6	BOWEN, NORTH
B62	X1	ROPER NS 3	BOWEN, NORTH
B62	Y1	ROPER NS 3	BOWEN, NORTH
B63		BLACKWATER NS 198	BOWEN, CENTRAL
B64		CAIRNS COUNTY NS 26	BOWEN, CENTRAL
B66		TALBOT NS 48	BOWEN, CENTRAL
B67	X1	COOROORAH 1	BOWEN, CENTRAL
B67	Y1	COOROORAH 1	BOWEN, CENTRAL
B67	Y2	COOROORAH 1	BOWEN, CENTRAL
B67	Y3	COOROORAH 1	BOWEN, CENTRAL
B67	Y4	COOROORAH 1	BOWEN, CENTRAL
B68		TALBOT NS 6	BOWEN, CENTRAL
B69		CAROA	BOWEN, SOUTH-WEST
B7		ROSELLA CREEK 1	BOWEN, NORTH
B70		EMERALD NS 21	BOWEN, CENTRAL
B71		EMERALD NS 1	BOWEN, CENTRAL
B72		BLACKWATER NS 176	BOWEN, CENTRAL
B73		EM 8 LEURA HILL	BOWEN, CENTRAL
B74		EM 4 LEURA CREEK	BOWEN, CENTRAL
B76		LEURA NS 31R	BOWEN, CENTRAL
B77		BLACKWATER NS 9	BOWEN, CENTRAL
B78		EMERALD NS 2	BOWEN, CENTRAL
B79		BLACKWATER NS 191	BOWEN, CENTRAL
B8		PARROT CREEK	BOWEN, NORTH
B80		TALBOT NS 239	BOWEN, CENTRAL
B81		DENISON NS 70	BOWEN, CENTRAL
B82		DENISON NS33/38R/39R	BOWEN, SOUTH-WEST
B83		BURN MEADOWS EM 10	BOWEN, SOUTH-WEST
B84		MOGOA RIVER EM 6-8	BOWEN, SOUTH-WEST
B86		DENISON NS 22/24R	BOWEN, SOUTH-WEST
B87		DENISON NS 31/36R	BOWEN, SOUTH-WEST
B88		DENISON NS 53	BOWEN, CENTRAL
B89		EMERALD NS 20	BOWEN, CENTRAL
B9		DRAKE NS 20	BOWEN, NORTH
B90		BLACKWATER NS 161	BOWEN, CENTRAL
B91		BLACKWATER NS 112	BOWEN, CENTRAL
B92	X1	COMET 1	BOWEN, CENTRAL
B92	Y1	COMET 1	BOWEN, CENTRAL
B92	Y2	COMET 1	BOWEN, CENTRAL
B92	Y3	COMET 1	BOWEN, CENTRAL
B93		BLACKWATER 1	BOWEN, CENTRAL
B94		EMERALD NS 57	BOWEN, CENTRAL
B96		DENISON NS 18	BOWEN, SOUTH-WEST
B97		DENISON NS 34	BOWEN, SOUTH-WEST
B98	X1	DENISON NS 29	BOWEN, SOUTH-WEST
B98	Y1	DENISON NS 29	BOWEN, SOUTH-WEST

B99	DENISON NS 25	BOWEN, SOUTH-WEST
C1	BARCOO JUNCTION 1	COOPER
C10	ALKINA 1	COOPER
C11	TANBAR 1	COOPER
C12	GILPEPPEE 1	COOPER
C13	GILPEPPEE 2	COOPER
C14	BARROLKA EAST 1	COOPER
C15	BARROLKA 1	COOPER
C16	DURHAM DOWNS 1	COOPER
C17	TARTULLA 1	COOPER
C18	JACKSON 1	COOPER
C19	ARRABURY 1	COOPER
C2	BUDGERYGAR 1	COOPER
C20	TALLALIA 1	COOPER
C21	YANPURRA 1	COOPER
C22	INNAMINCKA 1	COOPER
C23	PACKSADDLE 1	COOPER
C24	WIMMA 1	COOPER
C25	KUDRIEKE 1	COOPER
C26	COONATIE 1	COOPER
C27	WANTANA 1	COOPER
C28	BURLEY 1	COOPER
C29	BROLGA 1	COOPER
C3	THUNDA 1	COOPER
C30	FLY LAKE 4	COOPER
C31	FLY LAKE 3	COOPER
C32	TIRRAWARRA 10	COOPER
C33	TIRRAWARRA 5	COOPER
C34	MERRIMELIA 7	COOPER
C35	KANOWANA 1	COOPER
C36	WELCOME LAKE 1	COOPER
C37	JACK LAKE 1	COOPER
C38	GIDGEALPA 6	COOPER
C39	GIDGEALPA 1	COOPER
C4	INGELLA 1	COOPER
C40 X1	LAKE HOPE 1	COOPER
C41	WIRRARIE 1	COOPER
C42	PANDO 2	COOPER
C43	BOXWOOD 1	COOPER
C44	WANCOOCHA 1	COOPER
C45	MOOMBA 8	COOPER
C46	MOOMBA 2	COOPER
C47	BIG LAKE 1	COOPER
C48	CORKWOOD 1	COOPER
C49	DELLA 3	COOPER
C5	CHANDOS 1	COOPER
C50	DELLA 1	COOPER
C51	BURKE 1	COOPER
C52	DILCHEE 1	COOPER
C53	STRZELECKI 1	COOPER
C54	STRZELECKI 5	COOPER
C55	MUDLALEE 1	COOPER
C56	MURTEREE C-1	COOPER
C57	MURTEREE 1	COOPER
C58	MCKINLAY 1	COOPER
C59	TOOLACHEE 5	COOPER
C6	CHANDOS SOUTH 1	COOPER
C60	TOOLACHEE EAST 1	COOPER
C61	TOOLACHEE 6	COOPER
C62	BRUMBY 1	COOPER
C63	TOOLACHEE 1	COOPER
C64	TIPAREE A-1	COOPER
C65	MULGA 1	COOPER
C66	KUMBARIE 1	COOPER
C67	TINGA TINGANA 1	COOPER
C68	WEENA 1	COOPER

C69	CHERRI 1	COOPER
C7	CUMBROO 1	COOPER
C70	ORIENTOS 1	COOPER
C71	TICKALARA 1	COOPER
C72	HUME 1	COOPER
C73	YANKO 1	COOPER
C8	BODALLA 1	COOPER
C9	MT. HOWITT 1	COOPER
G1	TURRAWAN DDH 2A	GUNNEDAH
G11	BULGA DDH 1	GUNNEDAH
G12	BANDO DDH 1	GUNNEDAH
G13	GORAN DDH 1	GUNNEDAH
G14	DIGBY DDH 1	GUNNEDAH
G16	CURLEWIS DDH 1	GUNNEDAH
G17	TEXAS DDH 1	GUNNEDAH
G18	FERRIER DDH 2	GUNNEDAH
G19	GUNNADILLY DDH 1	GUNNEDAH
G2	TULLAMULLEN DDH 1	GUNNEDAH
G21	UOONA DDH 1	GUNNEDAH
G22	SPRINGFIELD DDH 1	GUNNEDAH
G23	TRINKEY DDH 1	GUNNEDAH
G24	BOMERA DDH 1	GUNNEDAH
G26	WILSON DDH 1	GUNNEDAH
G27	SALTWATER DDH 1	GUNNEDAH
G28	NAPIER DDH 1	GUNNEDAH
G29	QUEENSBOROUGH DDH 1	GUNNEDAH
G3	WALLA WALLA DDH 1	GUNNEDAH
G30	MT MARLOWE INLIER	GUNNEDAH
G31	BOOYAMURNA DDH 1	GUNNEDAH
G32	NANDOURA DDH 1	GUNNEDAH
G33	CURRYALL DDH 1	GUNNEDAH
G34	POGGY 1	GUNNEDAH
G35	DUNEDOO	GUNNEDAH
G36	BYLONG DDH 3	GUNNEDAH
G37	BYLONG DDH 2	GUNNEDAH
G38	BYLONG DDH 1	GUNNEDAH
G39	GROWEE GULPH DDH 1	GUNNEDAH
G4	DENISON DDH 1	GUNNEDAH
G41	WIDDEN 2	GUNNEDAH
G42	GOULBURN VALLEY DDH2	GUNNEDAH
G43	BAERAMI CREEK DDH 2	GUNNEDAH
G44	BAERAMI CREEK DDH 1	GUNNEDAH
G46	GOULBURN VALLEY DDH1	GUNNEDAH
G47	DOYLES CREEK DDH 10	GUNNEDAH
G48	DENMAN DDH 1	GUNNEDAH
G49	DOYLES CREEK DDH 14	GUNNEDAH
G51	STRATHEARN DDH 1	GUNNEDAH
G52	PARKVILLE 1	GUNNEDAH
G53	WINGEN	GUNNEDAH
G54	MURRURUNDI 1	GUNNEDAH
G6	YARRARI DDH 1	GUNNEDAH
G7	BENELABRI DDH 1	GUNNEDAH
G8	COOGAL DDH 1	GUNNEDAH
G9	BRIGALOW DDH 2	GUNNEDAH
K1	WALOONA CDH 1	OAKLANDS
K2	YANCO SOUTH CDH 1	OAKLANDS
K3	OAKLANDS RDH 18	OAKLANDS
K4	OAKLANDS RDH 2	OAKLANDS
K5	OAKLANDS RDH 17	OAKLANDS
K6	OAKLANDS RDH 13	OAKLANDS
K7	OAKLANDS RDH 11	OAKLANDS
L1	MARINA 1	SUB-LAURA
L2	BREEZA PLAINS 1	SUB-LAURA
L3	LAKEFIELD 1	SUB-LAURA
M1	MOUNT MULLIGAN	MOUNT MULLIGAN
S1	ST. HELIERS BMR 1	SYDNEY, NORTH

S10	X1	MAITLANDALE 1A	SYDNEY, NORTH
S10	Y1	MAITLANDALE 1A	SYDNEY, NORTH
S10	Y2	MAITLANDALE 1A	SYDNEY, NORTH
S100		BORE 37 (WOLLONGONG)	SYDNEY, SOUTH
S101		BORE 32 (WOLLONGONG)	SYDNEY, SOUTH
S102	X1	BORE 5 (WOLLONGONG)	SYDNEY, SOUTH
S102	Y1	BORE 5 (WOLLONGONG)	SYDNEY, SOUTH
S103	X1	YERRINBOOL 1	SYDNEY, SOUTH
S103	Y1	YERRINBOOL 1	SYDNEY, SOUTH
S104	X1	BORE 81 (WOLLONGONG)	SYDNEY, SOUTH
S104	Y1	BORE 81 (WOLLONGONG)	SYDNEY, SOUTH
S107		MOUNT KEMBLA 1	SYDNEY, SOUTH
S108	X1	MOUNT MURRAY 1	SYDNEY, SOUTH
S108	Y1	MOUNT MURRAY 1	SYDNEY, SOUTH
S109		STOCKYARD MOUNTAIN 1	SYDNEY, SOUTH
S11		DOYLES CREEK DDH 6	SYDNEY, NORTH
S110	X1	BELANGLO 1A	SYDNEY, SOUTH
S110	Y1	BELANGLO 1A	SYDNEY, SOUTH
S111		YARRUNGA CREEK	SYDNEY, SOUTH
S112		GREENWELL POINT 2	SYDNEY, SOUTH
S113	Y1	COONEMIA 1	SYDNEY, SOUTH
S113	Y2	COONEMIA 1	SYDNEY, SOUTH
S114		CALLALA DDH 1	SYDNEY, SOUTH
S116	Y1	PT. PERPENDICULAR 1	SYDNEY, SOUTH
S116	Y2	PT. PERPENDICULAR 1	SYDNEY, SOUTH
S117		ULLADULLA 1	SYDNEY, SOUTH
S118		WANDRAWANDIAN BORE	SYDNEY, SOUTH
S119		TOMERONG-HERRIGA RD	SYDNEY, SOUTH
S12		DOYLES CREEK DDH 2	SYDNEY, NORTH
S120		CLYDE RIVER	SYDNEY, SOUTH
S121		JERRAWANGALA LOOKOUT	SYDNEY, SOUTH
S122		POINTER GAP	SYDNEY, SOUTH
S123		PIGEON HOUSE	SYDNEY, SOUTH
S124		DURRAS-ULLADULLA	SYDNEY, SOUTH
S13		DOYLES CREEK DDH 3	SYDNEY, NORTH
S14	X1	JERRY PLAINS 1	SYDNEY, NORTH
S14	Y1	JERRY PLAINS 1	SYDNEY, NORTH
S14	Y2	JERRY PLAINS 1	SYDNEY, NORTH
S16		DOYLES CREEK DDH 4	SYDNEY, NORTH
S17	Y1	CAMBERWELL 1	SYDNEY, NORTH
S17	Y2	CAMBERWELL 1	SYDNEY, NORTH
S18	Y1	SEDGEFIELD 1	SYDNEY, NORTH
S18	Y2	SEDGEFIELD 1	SYDNEY, NORTH
S19		CRANKY CORNER	SYDNEY, NORTH
S2		BLACK HILL DDH 1,3	SYDNEY, NORTH
S20		NEW MAIN COLLIERY	SYDNEY, NORTH
S21		LITTLE TABLE TOP	SYDNEY, NORTH
S22		GLOUCESTER BASIN	GLOUCESTER
S23		MYALL SYNCLINE	MYALL SYNCLINE
S24		DOYLES CREEK DDH 11	SYDNEY, NORTH
S26	X1	LODER 1	SYDNEY, NORTH
S26	Y1	LODER 1	SYDNEY, NORTH
S27	Y1	BELFORD 1	SYDNEY, NORTH
S27	Y2	BELFORD 1	SYDNEY, NORTH
S28		GRETA DDH 1	SYDNEY, NORTH
S29		ALLANDALE	SYDNEY, NORTH
S3		SAVOY DDH 2	SYDNEY, NORTH
S30		LOCHINVAR	SYDNEY, NORTH
S31		GARRETTS TUNNEL	SYDNEY, NORTH
S32		DUCKHOLE BORE 1	SYDNEY, NORTH
S33		STOCKTON DDH 3	SYDNEY, NORTH
S34	X1	EAST MAITLAND 1	SYDNEY, NORTH
S34	Y1	EAST MAITLAND 1	SYDNEY, NORTH
S34	Y2	EAST MAITLAND 1	SYDNEY, NORTH
S36		GOSFORTH	SYDNEY, NORTH
S37		IRONBARK BRUSH 2	SYDNEY, NORTH

S38		CESSNOCK DDH 1	SYDNEY, NORTH
S39		MILLFIELD 1	SYDNEY, NORTH
S4		BAYSWATER 2 OPEN CUT	SYDNEY, NORTH
S40		DOYLES CREEK DDH 9	SYDNEY, NORTH
S41	Y1	MT. MURWIN 1	SYDNEY, NORTH
S41	Y2	MT. MURWIN 1	SYDNEY, NORTH
S42		HOWES VALLEY DDH 1	SYDNEY, NORTH
S43	X1	KELGOOLA DDH 1	SYDNEY, NORTH
S44		GLEN DAVIS P.O.	SYDNEY, WEST
S46		MELLONG 1	SYDNEY, NORTH
S47	X1	HOWES SWAMP 1	SYDNEY, NORTH
S47	Y1	HOWES SWAMP 1	SYDNEY, NORTH
S47	Y2	HOWES SWAMP 1	SYDNEY, NORTH
S48		HIGHER MACDONALD 1	SYDNEY, NORTH
S49		MURRAYS RUN DDH 1	SYDNEY, NORTH
S50		KULNURA 1	SYDNEY, NORTH
S51		BRUSH CREEK DDH 1	SYDNEY, NORTH
S52		DOORALONG DDH 1	SYDNEY, NORTH
S53		JILLIBY CREEK DDH 1	SYDNEY, NORTH
S54		COORANBONG DDH 1	SYDNEY, NORTH
S56		BOGGY CREEK RDH 1	SYDNEY, NORTH
S57	Y1	A.A. CO.'S DEEP BORE	SYDNEY, NORTH
S57	Y2	A.A. CO.'S DEEP BORE	SYDNEY, NORTH
S58		TORONTO	SYDNEY, NORTH
S59		MORISSET 4	SYDNEY, NORTH
S6		BAYSWATER BMR 1	SYDNEY, NORTH
S60		SOUTH WALLARAH 5	SYDNEY, NORTH
S61		WYEE BORE	SYDNEY, NORTH
S62		LAKE MUNMORAH 2	SYDNEY, NORTH
S63		BUNGAREE HORAH	SYDNEY, NORTH
S64		TERRIGAL 1-1A	SYDNEY, NORTH
S66		LOWER PORTLAND 1	SYDNEY, NORTH
S67	X1	UPPER COLO DDH 1	SYDNEY, NORTH
S67	Y1	UPPER COLO DDH 1	SYDNEY, NORTH
S68	X1	KURRAJONG HEIGHTS 1	SYDNEY, WEST
S68	Y1	KURRAJONG HEIGHTS 1	SYDNEY, WEST
S68	Y2	KURRAJONG HEIGHTS 1	SYDNEY, WEST
S69		BIRDS ROCK 22	SYDNEY, WEST
S7		JERRYS PLAINS DDH 6	SYDNEY, NORTH
S70		LITHGOW NEWNES 11	SYDNEY, WEST
S71		BROWNS GAP	SYDNEY, WEST
S72		WALFORD GULLY	SYDNEY, WEST
S73	Y1	WOODFORD DDH 1	SYDNEY, WEST
S73	Y2	WOODFORD DDH 1	SYDNEY, WEST
S74		KEDUMBA CREEK	SYDNEY, WEST
S76	Y1	BEDFORD CREEK BORE	SYDNEY, WEST
S76	Y2	BEDFORD CREEK BORE	SYDNEY, WEST
S77		MULGOA 2	SYDNEY, CENTRAL
S78		CAMDEN 8	SYDNEY, CENTRAL
S79		LEEHOME 1	SYDNEY, CENTRAL
S8		JERRYS PLAINS DDH 8	SYDNEY, NORTH
S80		BERKSHIRE PARK 1	SYDNEY, CENTRAL
S81		KENTHURST 1	SYDNEY, CENTRAL
S82	X1	DURAL SOUTH 1	SYDNEY, CENTRAL
S82	Y1	DURAL SOUTH 1	SYDNEY, CENTRAL
S82	Y2	DURAL SOUTH 1	SYDNEY, CENTRAL
S83		WINDEYERS HAWKES. R	SYDNEY, NORTH
S84		NARRABEEN	SYDNEY, CENTRAL
S86		BALMAIN SHAFTS, BORES	SYDNEY, CENTRAL
S87		FAIRFIELD 1	SYDNEY, CENTRAL
S88		CAPE BANKS DDH 1	SYDNEY, CENTRAL
S89		LIVERPOOL-MOOREBANK	SYDNEY, CENTRAL
S9		DENMAN DDH 7	SYDNEY, NORTH
S90		BURRAGORANG 101	SYDNEY, WEST
S91	Y1	MT. HUNTER 1	SYDNEY, SOUTH
S91	Y2	MT. HUNTER 1	SYDNEY, SOUTH

892	Y1	KIRKHAM 1	SYDNEY, SOUTH
892	Y2	KIRKHAM 1	SYDNEY, SOUTH
893		HAIGILLY 1	SYDNEY, SOUTH
894		BORE 72 (CAMDEN)	SYDNEY, SOUTH
896		BORE 75 (CAMDEN)	SYDNEY, SOUTH
897		NATIONAL PARK (SC)	SYDNEY, SOUTH
898	X1	WORONORA 1	SYDNEY, SOUTH
898	Y1	WORONORA 1	SYDNEY, SOUTH
898	Y2	WORONORA 1	SYDNEY, SOUTH
899	X1	CATARACT 1	SYDNEY, SOUTH
899	Y1	CATARACT 1	SYDNEY, SOUTH
T1	Y1	WARRONG 1	BOWEN, SUB-SURAT
T1	Y2	WARRONG 1	BOWEN, SUB-SURAT
T1	Y3	WARRONG 1	BOWEN, SUB-SURAT
T10	X1	WOMBLEBANK 1	BOWEN, SUB-SURAT
T10	Y1	WOMBLEBANK 1	BOWEN, SUB-SURAT
T10	Y2	WOMBLEBANK 1	BOWEN, SUB-SURAT
T10	Y3	WOMBLEBANK 1	BOWEN, SUB-SURAT
T11		TOOLOOMBILLA 1	BOWEN, SUB-SURAT
T12	Y1	KILLORAN 1	BOWEN, SUB-SURAT
T12	Y2	KILLORAN 1	BOWEN, SUB-SURAT
T12	Y3	KILLORAN 1	BOWEN, SUB-SURAT
T13	X1	GLENHAUGHTON 1	BOWEN, SUB-SURAT
T13	Y1	GLENHAUGHTON 1	BOWEN, SUB-SURAT
T13	Y2	GLENHAUGHTON 1	BOWEN, SUB-SURAT
T13	Y3	GLENHAUGHTON 1	BOWEN, SUB-SURAT
T14	X1	COCKATOO CREEK 1	BOWEN, SUB-SURAT
T14	Y1	COCKATOO CREEK 1	BOWEN, SUB-SURAT
T14	Y2	COCKATOO CREEK 1	BOWEN, SUB-SURAT
T14	Y3	COCKATOO CREEK 1	BOWEN, SUB-SURAT
T15		D.R.D. 6	BOWEN, SUB-SURAT
T16	X1	BURUNGA 1	BOWEN, SUB-SURAT
T16	Y1	BURUNGA 1	BOWEN, SUB-SURAT
T16	Y2	BURUNGA 1	BOWEN, SUB-SURAT
T16	Y3	BURUNGA 1	BOWEN, SUB-SURAT
T17	X1	WANDOAN 1	BOWEN, SUB-SURAT
T17	Y1	WANDOAN 1	BOWEN, SUB-SURAT
T18	X1	MEELEEBEE 1	BOWEN, SUB-SURAT
T18	Y1	MEELEEBEE 1	BOWEN, SUB-SURAT
T19	X1	ARBROATH 1	BOWEN, SUB-SURAT
T19	Y1	ARBROATH 1	BOWEN, SUB-SURAT
T2	X1	EDDYSTONE 1	BOWEN, SUB-SURAT
T2	Y1	EDDYSTONE 1	BOWEN, SUB-SURAT
T2	Y2	EDDYSTONE 1	BOWEN, SUB-SURAT
T20	X1	SIX MILE 1	BOWEN, SUB-SURAT
T20	Y1	SIX MILE 1	BOWEN, SUB-SURAT
T21	X1	SILVER VALLEY 1	BOWEN, SUB-SURAT
T21	Y1	SILVER VALLEY 1	BOWEN, SUB-SURAT
T22	X1	COMBARNGO 1	BOWEN, SUB-SURAT
T22	Y1	COMBARNGO 1	BOWEN, SUB-SURAT
T23	X1	APPLE TREE 1	BOWEN, SUB-SURAT
T23	Y1	APPLE TREE 1	BOWEN, SUB-SURAT
T24		MONCLOVA 1	BOWEN, SUB-SURAT
T25	X1	MYALL CREEK 1	BOWEN, SUB-SURAT
T25	Y1	MYALL CREEK 1	BOWEN, SUB-SURAT
T26		WERIBONE 1	BOWEN, SUB-SURAT
T27		LYNROCK 1	BOWEN, SUB-SURAT
T28	X1	TEY 1	BOWEN, SUB-SURAT
T28	Y1	TEY 1	BOWEN, SUB-SURAT
T29		LAWSON 1	BOWEN, SUB-SURAT
T3		CRYSTALBROOK 1	BOWEN, SUB-SURAT
T30	X1	UNDULLA 1	BOWEN, SUB-SURAT
T30	Y1	UNDULLA 1	BOWEN, SUB-SURAT
T31	X1	TARA 1	BOWEN, SUB-SURAT
T31	Y1	TARA 1	BOWEN, SUB-SURAT
T32		PAGET 1	BOWEN, SUB-SURAT

T33	X1	CADAWIN 1	BOWEN, SUB-SURAT
T33	Y1	CADAWIN 1	BOWEN, SUB-SURAT
T34	X1	MOONIE 1	BOWEN, SUB-SURAT
T34	Y1	MOONIE 1	BOWEN, SUB-SURAT
T35		WEIR 1	BOWEN, SUB-SURAT
T36		BOOROONDOO 1	BOWEN, SUB-SURAT
T37		WARRIGABIE 1	BOWEN, SUB-SURAT
T38	X1	YARRILL CREEK 1	BOWEN, SUB-SURAT
T38	Y1	YARRILL CREEK 1	BOWEN, SUB-SURAT
T39	X1	FLINTON 1	BOWEN, SUB-SURAT
T39	Y1	FLINTON 1	BOWEN, SUB-SURAT
T4	X1	WESTGROVE 1	BOWEN, SUB-SURAT
T4	Y1	WESTGROVE 1	BOWEN, SUB-SURAT
T4	Y2	WESTGROVE 1	BOWEN, SUB-SURAT
T4	Y3	WESTGROVE 1	BOWEN, SUB-SURAT
T4	Y4	WESTGROVE 1	BOWEN, SUB-SURAT
T40	X1	ALTON 1	BOWEN, SUB-SURAT
T40	Y1	ALTON 1	BOWEN, SUB-SURAT
T41	X1	KENTUCKY 1	BOWEN, SUB-SURAT
T41	Y1	KENTUCKY 1	BOWEN, SUB-SURAT
T42	X1	ULA ULA 1	BOWEN, SUB-SURAT
T42	Y1	ULA ULA 1	BOWEN, SUB-SURAT
T43	X1	MIMIMA 1	BOWEN, SUB-SURAT
T43	Y1	MIMIMA 1	BOWEN, SUB-SURAT
T44	X1	TIRGAN 1	BOWEN, SUB-SURAT
T44	Y1	TIRGAN 1	BOWEN, SUB-SURAT
T45	X1	BOOBERAMMA 1	BOWEN, SUB-SURAT
T45	Y1	BOOBERAMMA 1	BOWEN, SUB-SURAT
T46		MACINTYRE 1	BOWEN, SUB-SURAT
T47	X1	GOONDIWINDI 1	BOWEN, SUB-SURAT
T47	Y1	GOONDIWINDI 1	BOWEN, SUB-SURAT
T48	X1	LIMEBON 1	BOWEN, SUB-SURAT
T48	Y1	LIMEBON 1	BOWEN, SUB-SURAT
T49	X1	WERRINA 2	BOWEN, SUB-SURAT
T49	Y1	WERRINA 2	BOWEN, SUB-SURAT
T5	X1	KILDARE NORTH 1	BOWEN, SUB-SURAT
T5	Y1	KILDARE NORTH 1	BOWEN, SUB-SURAT
T5	Y2	KILDARE NORTH 1	BOWEN, SUB-SURAT
T50		GARAH 1	BOWEN, SUB-SURAT
T51	X1	GIL GIL 1	BOWEN, SUB-SURAT
T51	Y1	GIL GIL 1	BOWEN, SUB-SURAT
T52	X1	MT. PLEASANT 1	BOWEN, SUB-SURAT
T52	Y1	MT. PLEASANT 1	BOWEN, SUB-SURAT
T6	X1	KIA ORA 1	BOWEN, SUB-SURAT
T6	Y1	KIA ORA 1	BOWEN, SUB-SURAT
T6	Y2	KIA ORA 1	BOWEN, SUB-SURAT
T7		TAROOM 11-11A	BOWEN, SUB-SURAT
T8		TAROOM 12-12A	BOWEN, SUB-SURAT
T9	X1	GLENTULLOCH 1	BOWEN, SUB-SURAT
T9	Y1	GLENTULLOCH 1	BOWEN, SUB-SURAT
T9	Y2	GLENTULLOCH 1	BOWEN, SUB-SURAT
T9	Y3	GLENTULLOCH 1	BOWEN, SUB-SURAT
T9	Y4	GLENTULLOCH 1	BOWEN, SUB-SURAT

DENISON NS 29 B98 X1 23 46'57"147 54'22"E
DENISON NS 29 B98 Y1 23 46'57"147 54'22"E

ABBREVIATIONS AND CONTRACTIONS
USED IN COMPT DATA-BASE

ABBREVIATION	DEFINITION
ABND	ABUNDANT
AD	AIR-DRIED
AGLM	AGGLOMERATE
ALT	ALTERNATE(ING)
ANDES	ANDESITE
ANG	ANGULAR
ANTH	ANTHRACITE(IC)
AREN	ARENITE
ARG	ARGILLACEOUS
ASSOC	ASSOCIATED
AVG	AVERAGE
BAS	BASALT
BENT	BENTONITE(IC)
B'DARY	BOUNDARY
BDD, BDG	BEDDED, BEDDING
BIOT	BIOTITE
BIOTURB	BIOTURBATED, BIOTURBATION
BIT	BITUMINOUS
BL	BLUE
BLK	BLACK
BNDD, BNDG	BANDED, BANDING
BR	BROWN
BRACH(S)	BRACHIOPOD(S)
BREC	BRECCIA, BRECCIATED
BRIT	BRITTLE
C	COARSE
CA	CIRCA, APPROXIMATELY
CALC	CALCAREOUS
CARB	CARBONACEOUS
CARB	CARBONIFEROUS
CBL	COBBLE
CGL	CONGLOMERATE
CHL	CHLORITE(IC)
CK	CREEK
CKD	COKED
C'LESS	COLOURLESS
CLST	CLAYSTONE
CM	COAL MEASURES
CMT	CEMENT
CNTD	CONTORTED
COL	COLOUR, COLOURED
COMM	COMMON(LY)
CONSID	CONSIDERABLE
CONSOL	CONSOLIDATED
CONT	CONTINENTAL
CONTAM	CONTAMINATED, CONTAMINATION
CONTEMP	CONTEMPORANEOUS
COQ	COQUINITE
CORR	CORRELATIVE
CR	CREAM
CRET	CRETACEOUS
DAC	DACITE
DAF	DRY ASH FREE
DDH	DIAMOND DRILLHOLE
DEG(S), DG(S)	DEGREE(S)
DEP	DEPOSIT(ED)
DK	DARK

DOL	DOLERITE
DOM	DOMINANT, DOMINATE
ELEV	ELEVATION
ENVIRON	ENVIRONMENT
EQUIV	EQUIVALENT
EXCL	EXCLUDING
EXPD	EXPOSED
EXPLAN	EXPLANATORY
F	FINE
FLD	FELDSPAR, FELDSPATHIC
FLT	FLOAT
FLUV	FLUVIAL
FM	FORMATION
FORAMS	FORAMINIFERA
FOSS	FOSSIL(S)
FRACT	FRACTURE(D)
FRAG	FRAGMENT(S)
GEN	GENERALLY
GLAUC	GLAUCONITE(IC)
GLEND	GLENDONITE(S)
GN	GREEN
GP	GROUP
GR	GRAIN(ED)
GRAN	GRANITE(IC)
GWKE	GREYWACKE
GY	GREY
HEM	HEMATITE
ID	IDENTIFICATION
IG	IGNEOUS
IMPERM	IMPERMEABLE
IMPR	IMPRESSION(S)
INCL	INCLUDE(D)(ING)
INFL	INFLUENCE
INT	INTERVAL
INTBD(D)(G)	INTERBED(ED)(ING)
INTERP	INTERPRETATION
INTLAMD	INTERLAMINATED
INTRAFM	INTRAFORMATIONAL
INTRUS	INTRUSION, INTRUSIVE
IRREG	IRREGULAR
KAOL	KAOLIN(ITIC)
L	LOWER
LAB	LABILE
LAM	LAMINAE
LAMD	LAMINATED
LAMN	LAMINATION(S)
LI	LITHIC
LRG	LARGE
LST	LIMESTONE
LT	LIGHT
M	MEDIUM
MASS	MASSIVE
MAT	MATERIAL
MB	MEMBER
MDST	MUDSTONE
METAM	METAMORPHIC
MICAC	MICACEOUS
MOD	MODERATE(LY)

MOIST	MOISTURE
MT	MOUNT, MOUNTAIN
MTX	MATRIX
MUSC	MUSCOVITE
NOD	NODULE(S)
NUM	NUMEROUS
OCCAS	OCCASIONAL(LY)
OL	OLIVE
ORG	ORGANIC, ORGANICALLY
PALY	PALYNOLOGY, PALYNOLOGICAL
PBL, PBLY	PEBBLE(S), PEBBLY
PDH	PERCUSSION DRILLHOLE
PLT FOSS	PLANT FOSSILS
PLT REM	PLANT REMAINS
PREDOM	PREDOMINANTLY
PROB	PROBABLE, PROBABLY
PRTG(S)	PARTING(S)
PT	POINT
PURP	PURPLE(ISH)
PY	PYRITE(IC)
QZ	QUARTZ
QZITE	QUARTZITE
QZOSE	QUARTZOSE
R	RESISTIVITY
RC	RAW COAL
RD	RED
RDH	ROTARY DRILLHOLE
RHY	RHYOLITE
RND	ROUNDED
RX	ROCKS
SED	SEDIMENTS, SEDIMENTARY
SEQ	SEQUENCE
SH	SHALE
SID	SIDERITE
SIL	SILICEOUS
SL	SLIGHT
SLICK(ED)	SLICKENSIDE(D)
SLMP(D)	SLUMP(ED)
SLTST	SILTSTONE
SM(S)	SEAM(S)
SP	SELF-POTENTIAL
SRTD, SRTG	SORTED, SORTING
SST	SANDSTONE
ST	STAGE
S'TIMES	SOMETIMES
SUBANG	SUBANGULAR
SUB-BIT	SUB-BITUMINOUS
SUB-GP	SUB-GROUP
SUBGWKE	SUBGREYWACKE
SUBLAB	SUBLABILE
SUBRND	SUBROUND
SUPER-GP	SUPER-GROUP
SURF	SURFACE, SURFICIAL
TD	TOTAL DEPTH
TERRIG	TERRIGENOUS
TF	TUFF
TFAC	TUFFACEOUS
T'OUT	THROUGHOUT
TNG	TONGUE

U	UPPER
UNDIFF	UNDIFFERENTIATED
UNCONFM	UNCONFORMABLE, UNCONFORMITY
V	VERY
VAR	VARIABLE(LY)
VIT	VITREOUS, VITRINITE
VOLC(S)	VOLCANIC(S)
WC	WASHED COAL
WCR,W.C.R.	WELL COMPLETION REPORT
WH	WHITE
WTHRD	WEATHERED
XBD(D)(G)	CROSS-BED(ED)(ING)
XL(S)	CRYSTAL(S)
YEL	YELLOW

ORGANIZATION ABBREVIATIONS USED

ABBREVIATION	ORGANIZATION
A.A.CO.	AUSTRALIAN AGRICULTURAL COMPANY
AAE	AMOCO AUSTRALIA EXPLORATION COMPANY
AAO	ASSOCIATED AUSTRALIAN OILFIELDS N.L.
AAP	AUSTRALIAN AQUITAINE PETROLEUM PTY LTD
AAR	ASSOCIATED AUSTRALIAN RESOURCES N.L.
AFO	ASSOCIATED FRENEY OIL FIELDS
AMOSEAS	AMERICAN OVERSEAS PETROLEUM LTD
AOD	ALLIANCE OIL DEVELOPMENT AUSTRALIA N.L.
AOE	AUSTRALIAN OIL EXPLORATION
AOG	AUSTRALIAN OIL AND GAS CORPORATION LTD
AOP	AMERICAN OVERSEAS PETROLEUM LTD
APA	ALLIANCE PETROLEUM AUSTRALIA N.L.
APC	AMERADA PETROLEUM CORPORATION OF AUSTRALIA LTD
APN	AMALGAMATED PETROLEUM EXPLORATION PTY LTD
ASO	AUSTRALIAN SUN OIL COMPANY LTD
BCCM	BOWEN CONSOLIDATED COAL MINES
BHP	BROKEN HILL PTY COMPANY LTD
BMR	BUREAU OF MINERAL RESOURCES
BPO	BEAVER EXPLORATION AUSTRALIA N.L.-PEXA OIL N.L.
CBO	CABOT CORPORATION-BLUEBERRY OIL CORPORATION
CO	CRUSADER OIL N.L.
CON	CRUSADER OIL N.L.
CPC	CONORADA PETROLEUM CORPORATION
DAP	DELHI AUSTRALIAN PETROLEUM LTD
DIO	DELHI INTERNATIONAL OIL CORPORATION
DM	NEW SOUTH WALES DEPARTMENT OF MINES
DMC	DAMPIER MINING COMPANY
DPP	DELHI PETROLEUM PTY LTD
DSL	DELHI-SANTOS LTD
ENL	EXOIL N.L.-TRANSOIL N.L.
ESSO	ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC
FDN	FARMOUT DRILLERS N.L.
FPN	FLINDERS PETROLEUM N.L.
GENOA	GENOA OIL N.L.
GSQ	GEOLOGICAL SURVEY OF QUEENSLAND
HEP	HARTOGEN EXPLORATIONS PTY LTD
HOM	HOUSTON OIL AND MINERALS OF AUSTRALIA LTD INC
HON	HARBOURSIDE OIL N.L.
HPP	HEMATITE PETROLEUM PTY LTD
LOL	LONGREACH OIL LTD
MON	MURUMBA OIL N.L.
MPA	MARATHON PETROLEUM AUSTRALIA LTD
MPC	MAGELLAN PETROLEUM CORPORATION
ODN	OIL DEVELOPMENT N.L.
PAO	PHILLIPS AUSTRALIAN OIL COMPANY
PEC	PLANET EXPLORATION COMPANY PTY LTD
PEXA	PEXA OIL N.L.
PON	PURSUIT OIL N.L.
PPC	PHILLIPS PETROLEUM COMPANY
QDM	QUEENSLAND DEPARTMENT OF MINES
SHELL	SHELL DEVELOPMENT (AUSTRALIA) PTY LTD
SL	SANTOS LTD
SPL	SOUTH PACIFIC PTY LTD
SQD	SHELL QUEENSLAND DEVELOPMENT COMPANY
TEA	TOTAL EXPLORATION AUSTRALIA PTY LTD
TEPL	TARGET EXPLORATION PTY LTD
UKA	UNION OIL DEVELOPMENT CORPORATION-KERN COUNTY LAND COMPANY-AUSTRALIAN OIL & GAS CORPORATION LTD
VNL	VAMGAS N.L.

LAURA BASIN PETROLEUM WELLS INDEX

BREEZA PLAINS 1	CON BREEZA PLAINS 1
LAKEFIELD 1	CON LAKEFIELD 1
MARINA 1	CBO MARINA 1

BOWEN BASIN PETROLEUM WELLS INDEX

ARCADIA 7	AAO 7 ARCADIA
ARCTURUS 1	AFO ARCTURUS 1
BANDANNA 1	AFO BANDANNA 1
BLACKWATER 1	BHP BLACKWATER 1
COMET 1	AFO COMET 1
COMETSIDE 1	APN COMETSIDE 1
CONSUELO 3	AOE 3 CONSUELO
COOROORAH 1	AFO COOROORAH 1
INDERI 1	AFO INDERI 1
MORELLA 1	SQD MORELLA 1
MOURA 1	TEPL MOURA 1
PURBROOK 1	AFO PURBROOK 1
PURBROOK STH 1	APN PURBROOK STH 1
REIDS DOME 1	AOE REIDS DOME 1
ROLLESTON 1	AFO ROLLESTON 1
ROSELLA CREEK 1	TEPL ROSELLA CREEK 1
SHOTOVER 1	HOM SHOTOVER 1
STRUAN 1	AFO STRUAN 1
SUNLIGHT 1	AFO SUNLIGHT 1
WARRINILLA 1	PEC WARRINILLA 1
WARRINILLA NTH 1	PEC WARRINILLA NTH 1
YANDINA 1	AFO YANDINA 1

BOWEN, SUB-SURAT PETROLEUM WELLS INDEX

ALTON 1	UKA ALTON 1
APPLE TREE 1	AAR APPLE TREE 1
ARBROATH 1	AAO ARBROATH 1
BOOBERANNA 1	UKA BOOBERANNA 1
BOOROONDOO 1	UKA BOOROONDOO 1
BURUNGA 1	UKA BURUNGA 1
CABAWIN 1	UKA CABAWIN 1
COCKATOO CREEK 1	UKA COCKATOO CREEK 1
CRYSTALBROOK 1	PEC CRYSTALBROOK 1
FLINTON 1	UKA FLINTON 1
GARAH 1	ESSO GARAH 1
GIL GIL 1	ESSO GIL GIL 1
GLENHAUGHTON 1	MPA GLENHAUGHTON 1
GLENTULLOCH 1	AAO GLENTULLOCH 1
GOONDIWINDI 1	UKA GOONDIWINDI 1
KENTUCKY 1	UKA KENTUCKY 1
KIA ORA 1	AAO KIA ORA 1
KILDARE NORTH 1	AAO KILDARE NORTH 1
KILLORAN 1	AAO KILLORAN 1
LAWSON 1	UKA LAWSON 1
LIMEBON 1	UKA LIMEBON 1
LYNROCK 1	UKA LYNROCK 1
MACINTYRE 1	UKA MACINTYRE 1
MEELEEBEE 1	AAO MEELEEBEE 1
MINIMA 1	UKA MINIMA 1
MONCLOVA 1	HEP MONCLOVA 1
MOONIE 1	UKA MOONIE 1
MT PLEASANT 1	ESSO MT PLEASANT 1
MYALL CREEK 1	UKA MYALL CREEK 1
PAGET 1	UKA PAGET 1
SILVER VALLEY 1	AAR SILVER VALLEY 1
SIX MILE 1	AAR SIX MILE 1
TARA 1	UKA TARA 1
TEY 1	UKA TEY 1
TINGAN 1	UKA TINGAN 1
TOOLOOMBILLA 1	PEC TOOLOOMBILLA 1
ULA ULA 1	UKA ULA ULA 1
UNDULLA 1	UKA UNDULLA 1
WANDOAN 1	UKA WANDOAN 1
WARRIGABIE 1	UKA WARRIGABIE 1
WARRONG 1	PLANET WARRONG 1
WEIR 1	UKA WEIR 1
WERIBONE 1	UKA WERIBONE 1
WERRINA 2	HON WERRINA 2
WESTGROVE 3	AAO WESTGROVE 3
WOMBLEBANK 1	AAO WOMBLEBANK 1
YARRILL CREEK 1	UKA YARRILL CREEK 1

SYDNEY BASIN PETROLEUM WELLS INDEX

BADGELLY 1	AOG BADGELLY 1
BAYSWATER 1	BAYSWATER BMR 1
BELANGLO 1A	
BELFORD 1	AOG BELFORD 1
BERKSHIRE PARK 1	AOG BERKSHIRE PARK 1
CAMBERWELL 1	AOG CAMBERWELL 1
CAMDEN 1	AOG CAMDEN 1
CATARACT 1	AOD CATARACT 1
COONEMIA 1	GENOA COONEMIA 1
DURAL SOUTH 1	SHELL DURAL SOUTH 1
EAST MAITLAND 1	PEC EAST MAITLAND 1
FAIRFIELD 1	AOG FAIRFIELD 1
GREENWELL POINT 2	GREENWELL POINT 2
HIGHER MACDONALD 1	HIGHER MACDONALD 1
HOWES SWAMP 1	ESSO HOWES SWAMP 1
JERRY PLAINS 1	ESSO JERRY PLAINS 1
KENTHURST 1	AOG KENTHURST 1
KIRKHAM 1	AOG KIRKHAM 1
KULNURA 1	AOG KULNURA 1
KURRAJONG HEIGHTS 1	KURRAJONG HEIGHTS 1
LEEHOME 1	AOG LEEHOME 1
LODER 1	AOG LODER 1
LOWER PORTLAND 1	AOG LOWER PORTLAND 1
MARTINDALE 1A	AOG MARTINDALE 1A
MELLONG 1	AOG MELLONG 1
MORISSET 4	AOG MORISSET 4
MT HUNTER 1	AOG MT HUNTER 1
MT MURWIN 1	AOG MT MURWIN 1
MULGOA 2	AOG MULGOA 2
PT PERPENDICULAR 1	PT PERPENDICULAR 1
SEDGEFIELD 1	AOG SEDGEFIELD 1
ST HELIERS 1	ST HELIERS BMR 1
STOCKYARD MOUNTAIN 1	STOCKYARD MOUNTAIN 1
TERRIGAL 1 + 1A	TERRIGAL 1 + 1A
ULLADULLA 1	BMR ULLADULLA 1
WORONORA 1	AOG WORONORA 1

GALILEE BASIN PETROLEUM WELLS INDEX

ALICE RIVER 1	FDN ALICE RIVER 1
ALLANDALE 1	BPO ALLANDALE 1
ALVA 1	HEP ALVA 1
ARAMAC 1	QDM ARAMAC 1
BALFOUR 1	AMOSEAS BALFOUR 1
BARCOO 1	ASO BARCOO 1
BERYL 1	AAO BERYL 1
BIRKHEAD 1	SPL BIRKHEAD 1
BONNIE 1	PAO BONNIE 1
BOREE 1	AMOSEAS BOREE 1
BROOKWOOD 1	ENL BROOKWOOD 1
BURY 1	PAO BURY 1
CARLOW 1	PAO CARLOW 1
COLLABARA 1	PAO COLLABARA 1
COREENA 1	BPO COREENA 1
CORFIELD 1	MPC CORFIELD 1
CUNNO 1	AMOSEAS CUNNO 1
DARTMOUTH 1	PAO DARTMOUTH 1
EASTWOOD 1	AAO EASTWOOD 1
ETONVALE 1	PPC ETONVALE 1
FAIRLEA 1	ASO FAIRLEA 1
GILMORE 1	PPC GILMORE 1
GLENARAS 1	PAO GLENARAS 1
GOLEBURRA 1	HPP GOLEBURRA 1
GREY RANGE 1	HEP GREY RANGE 1
HEXHAM 1	QDM HEXHAM 1
HULTON 1	LOL HULTON 1
JERICHO 1	AOD JERICHO 1
KOBURRA 1	FPN KOBURRA 1
LAKE GALILEE 1	ENL LAKE GALILEE 1
LEOPARDWOOD 1	PAO LEOPARDWOOD 1
LOVELLE DOWNS 1	HPP LOVELLE DOWNS 1
MARANDA 1	ODN MARANDA 1
MARCHMONT 1	LOL MARCHMONT 1
MUTTABURRA 1	PON MUTTABURAA 1
OOROONOO 1	CPC OOROONOO 1
RAND 1	LOL RAND 1
RAVENSBOURNE 1	AOP RAVENSBOURNE 1
SALTERN CREEK 1	LOL SALTERN CREEK 1
STAFFORD 1	PAO STAFFORD 1
THUNDERBOLT 1	APC THUNDERBOLT 1
TOWERHILL 1	AAE TOWERHILL 1
VALETTA 1	BPO VALETTA 1
WESTBOURNE 1	AMOSEAS WESTBOURNE 1
WESTON 1	HPP WESTON 1
YONGALA 1	AOD YONGALA 1

COOPER BASIN PETROLEUM WELLS INDEX

ALKINA 1	DPP ALKINA 1
ARRABURY 1	FPN ARRABURY 1
BARCOO JUNCTION 1	CO BARCOO JUNCTION 1
BARROLKA 1	AAP BARROLKA 1
BARROLKA EAST 1	DPP BARROLKA EAST 1
BIG LAKE 1	DIO BIG LAKE 1
BODALLA 1	BPP BODALLA 1
BOXWOOD 1	DAP BOXWOOD 1
BROLGA 1	DIO BROLGA 1
BRUMBY 1	DIO BRUMBY 1
BUDGERYGAR 1	AOD BUDGERYGAR 1
BURKE 1	DIO BURKE 1
BURLEY 1	DIO BURLEY 1
CHANDOS 1	AOD CHANDOS 1
CHANDOS SOUTH 1	AOD CHANDOS SOUTH 1
CHERRI 1	PEXA CHERRI 1
COONATIE 1	FPN COONATIE 1
CORKWOOD 1	DPP CORKWOOD 1
CUMBROO 1	AOD CUMBROO 1
DELLA 1	PON DELLA 1
DELLA 3	DIO DELLA 3
DILCHEE 1	DPP DILCHEE 1
DURHAM DOWNS 1	DSL DURHAM DOWNS 1
FLY LAKE 3	DIO FLY LAKE 3
FLY LAKE 4	SL FLY LAKE 4
GIDGEALPA 1	DSL GIDGEALPA 1
GILPEPPEE 1	AOD GILPEPPEE 1
GILPEPPEE 2	DPP GILPEPPEE 2
HUME 1	DPP HUME 1
INGELLA 1	DPP INGELLA 1
INNAMINCKA 1	DAP INNAMINCKA 1
JACK LAKE 1	DPP JACK LAKE 1
JACKSON 1	DPP JACKSON 1
KANOWANA 1	VNL KANOWANA 1
KUDRIEKE 1	DIO KUDRIEKE 1
KUMBARIE 1	PEXA KUMBARIE 1
LAKE HOPE 1	MON LAKE HOPE 1
MCKINLEY 1	DPP MCKINLEY 1
MERRIMELIA 7	DPP MERRIMELIA 7
MOOMBA 2	DAP MOOMBA 2
MOOMBA 8	DAP MOOMBA 8
MT HOWITT 1	DSL MT HOWITT 1
MUDLALEE 1	DAP MUDLALEE 1
MULGA 1	DAP MULGA 1
MURTEREE 1	PON MURTEREE 1
MURTEREE C-1	DIO MURTEREE C-1
ORIENTOS 1	DSL ORIENTOS 1
PACKSADDLE 1	APA PACKSADDLE 1
PANDO 2	DAP PANDO 2
STRZELECKI 1	PON STRZELECKI 1
STRZELECKI 5	DPP STRZELECKI 5
TALLALIA 1	FPN TALLALIA 1
TANBAR 1	AAP TANBAR 1
TARTULLA 1	DPP TARTULLA 1
THUNDA 1	AOD THUNDA 1
TICKALARA 1	TEA TICKALARA 1
TILPAREE A-1	DIO TILPAREE A-1
TINGA TINGANA 1	DSL TINGA TINGANA 1
TIRRAWARRA 5	DIO TIRRAWARRA 5
TIRRAWARRA 10	DIO TIRRAWARRA 10
TOOLACHEE 1	DAP TOOLACHEE 1
TOOLACHEE 5	DIO TOOLACHEE 5
TOOLACHEE 6	DIO TOOLACHEE 6
TOOLACHEE EAST 1	DIO TOOLACHEE EAST 1

WANCOOCHA 1
WANTANA 1
WEENA 1
WELCOME LAKE 1
WIMMA 1
WIRRARIE 1
YANKO 1
YANPURRA 1

DAP WANCOOCHA 1
DPP WANTANA 1
PEXA WEENA 1
DPP WELCOME LAKE 1
DPP WIMMA 1
PEXA WIRRARIE 1
DPP YANKO 1
FPN YANPURRA 1

APPENDIX C

PERMIAN COALS OF EASTERN AUSTRALIA

CSIRO DATA-BASE

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CSIRO DATA BASE 1 - PART 1

REFLECTANCE DATA MEASURED FOR THE PERMIAN COALS OF EASTERN AUSTRALIA PROJECT

Control Point	Sample description	Depth	Petrog. number	Number of readings	Std. dev.	R_o(%)
PLATE 23	**BOWEN BASIN**					
64R	Boomi 1	618 m	33998	58	0.05	0.36
		915 m	33999	56	0.04	0.40
		1239 m	34000	55	0.04	0.47
		1388 m	34001	52	0.10	0.48
		1500 m	34002	52	0.06	0.51
		1594 m	34003	43	0.06	0.50
63R	Gil Gil 1	1187 m	34611	46	0.07	0.47
		1308 m	34612	36	0.10	1.02
66R	Goondiwindi 1	1239 m	34414	53	0.04	0.45
		1462 m	34415	41	0.05	0.62
		1552 m	34416	57	0.06	0.68
		1553 m	34614	50	0.06	0.66
		1699 m	34615	31	0.09	0.50
		1960 m	34417	27	0.06	0.53
		2118 m	34616	33	0.08	0.57
		2126 m	34418	12	0.21	0.69
171R	Mount Pleasant 1	1827 m	34618	56	0.06	0.70
65R	Macintyre 1	1660 m	33993	47	0.03	0.48
		1920 m	33994	44	0.095	0.67
		2124 m	33995	55	0.04	0.65
		2405 m	34617	12	0.09	0.67
		2406 m	33997	68	0.05	0.75
PLATE 23	**GUNNEDAH BASIN**					
59R	Bohena 1	482 m	33978	-	-	?0.6
		767 m	33980	45	0.11	0.52
		853 m	33981	60	0.05	0.80
56R	Borah 1	22 m	34422	60	0.08	0.68
		34 m	34423	46	0.06	0.70
		125 m	34424	55	0.05	0.62
		185 m	34425	32	0.09	0.58
		235 m	34426	55	0.05	0.56
		262 m	34427	56	0.06	0.70
		284 m	34428	38	0.04	0.69
		310 m	34429	40	0.06	0.64
		310 m	34430	39	0.09	0.62
54R	Caroona 3	30 m	34411	64	0.08	0.71
		84 m	34412	45	0.05	0.63
		114 m	34413	55	0.05	0.65
58R	Pilliga 1	416 m	34407	28	0.07	0.57
		565 m	34408	47	0.10	0.71
		658 m	34409	58	0.08	0.62
		843 m	34410	10	0.24	0.66
53R	Quirindi 1	291 m	34008	43	0.09	0.80
		490 m	34007	-	-	>2.0?
		949 m	34006	60	0.07	0.84
		1233 m	34005	43	0.07	0.84

Control Point	Sample description	Depth	Petrog. number	Number of readings	Std. dev.	R_o(%)
PLATE 23	**GUNNEDAH BASIN** (cont.)					
61R	Sandy Camp 1	183 m	34419	51	0.04	0.42
		373 m	34420	24	0.04	0.39
		456 m	34421	33	0.03	0.40
57R	Tunmallalee 1	175 m	33986	80	0.05	0.72
		202 m	33987	14	0.08	0.53
		240 m	33988	65	0.09	0.51
		291 m	33989	69	0.08	0.54
		362 m	33991	70	0.06	0.57
		378 m	33992	9	0.08	0.60
60R	Wee Waa 1	262 m	33982	67	0.05	0.53
		371 m	33983	55	0.05	0.54
		546 m	33984	25	0.10	0.59
		641 m	33985	54	0.04	0.59
170R	Wondobah 1	at dyke	35119	57	0.89	4.75
		20cm from dyke	35116	33	0.38	4.11
PLATE 23	**SYDNEY BASIN**					
168R	Cape Banks 1	697 m	25949	40	0.08	1.54
		939 m	32904	32	0.08	1.41
		941 m	32890	26	0.08	1.43
		991 m	32892	34	0.07	1.48
		1023 m	32894	31	0.09	1.47
		1036 m	32896	35	0.08	1.42
		1039 m	32898	30	0.11	1.54
7R	Huntley Coll.	-0 m	33498	22	0.66	4.81
	15 m thick dyke	-2 m	33500	47	1.04	4.86
		-3 m	33501	62	1.22	4.60
		-4 m	33502	46	0.70	5.00
		-5 m	33503	49	0.41	3.38
		-10 m	33504	58	0.56	3.49
		-15 m	33505	33	0.17	2.53
		-20 m	33506	87	0.07	1.34
		-25 m	33507	48	0.06	1.00
7R	Huntley Coll.	687.5'	32631	-	-	3.88
	HW 2	690.5'	32630	-	-	2.80
		768'	32634	-	-	2.22
		808'	32629	-	-	1.14
		817'	32632	-	-	1.04
		838'	32633	-	-	0.93
23R	Megalong Valley,	outcrop	33097	50	0.10	0.69
169R	South Bulli Coll.	-10 cm	32659	27	0.13	3.09
	60 cm thick dyke	-30 cm	32660	15	0.16	2.26
		-50 cm	32661	22	0.01	1.70
		-100 cm	32662	30	0.04	1.17
		-200 cm	32663	35	0.12	1.02

CSIRO DATA BASE 1 - PART 2

REGIONAL REFLECTANCE DATA

Control point	Location and description	Reflectance (%) Surface	Upper Permian	Middle-upper Permian* and Lower Permian
PLATE 23	**OAKLANDS BASIN**			
1R	Oaklands	<0.36	0.36	-
PLATE 23	**SYDNEY BASIN**			
2R	Clyde Valley	0.85	-	0.85
3R	Bunnair Ck	0.65	-	0.55
4R	Southern coll.	<0.71	-	0.71*
5R	Belangelo coll.	<0.58	-	0.58*
6R	Berrima coll.	<0.76	-	0.76*
7R	Huntley coll.	<1.0	1.0	1.1*
8R	Nebo coll.	<1.23	-	1.23*
9R	Bulli coll.	<1.14	1.14	-
10R	DM Illawarra 37	<1.19	1.19	1.33*
11R	Bulli Main coll.	<1.20	1.20	-
12R	Appin coll.	<1.26	1.26	-
13R	DM Illawarra 6	<1.38	1.38	1.66*
14R	DM Illawarra 66	<1.40	1.40	-
15R	Valley No.2 coll.	<0.89	0.89	-
16R	Nattai-Bulli coll.	<0.96	0.96	-
17R	Oakdale coll.	<1.10	1.10	-
18R	Tempe	0.99	-	-
19R	Balmain coll.	<1.35	1.35	-
20R	Avalon	0.91	-	-
21R	Dural bores	0.64	1.35	-
22R	Kurrajong Heights 1	0.45	1.03	-
23R	Megalong Valley	0.69	0.69	-
24R	Hartley Main coll.	<0.76	0.76	-
25R	Wallerawang coll.	0.66*	-	0.66*
26R	Ben Bullen coll.	<0.68	-	0.68*
27R	Wancol Lithgow 3	<0.73	0.73	-
28R	Wancol Lithgow 2	<0.83	0.83	0.90*
29R	Wancol Lithgow 4	<0.75	0.75	-
30R	Howes Swamp 1	0.50	1.05	-
31R	Mellong 1	<0.80	0.80	-
32R	Kandos	<0.69	-	0.69*
33R	Terrigal 1	0.70	1.25	-
34R	Wyong 10	<0.79	0.79-0.87	-
35R	Newvale 1	<0.71	0.71	-
36R	Swansea bores	0.70		
37R	Pacific coll.	<0.74	0.74	-
38R	Waratah 3	<0.77	0.77	-
39R	Boston 3	<0.77	0.77	-
40R	East Maitland 1	0.78	1.18	-
41R	Elrington coll.	<0.67	-	0.67
42R	Pelton coll.	<0.63	-	0.63
43R	Stanford Main coll	<0.62	-	0.62
44R	Broke T.S.2	<0.76	0.76	-
45R	Jerrys Plains 1	0.63	0.68	-
46R	Camberwell 8	0.74	0.74	-
47R	Ravensworth 2	0.67	0.67	-
48R	Balmoral bores	0.60	0.63	-
49R	Doyles Creek bores	0.71	0.71	-
50R	Muswellbrook coll.	1.10	1.10	-
51R	Poggy 1	<0.60	0.65	-
PLATE 23	**GLOUCESTER BASIN**			
52R	Gloucester coll.	0.90	0.90	0.90

Control point	Location and description	Reflectance (%) Surface	Upper Permian	Middle-upper Permian* and Lower Permian
PLATE 23	**GUNNEDAH BASIN**			
53R	Quirindi 1	<0.60	0.80	0.70
54R	Caroona 3	0.60	0.60	-
55R	Gunnedah coll.	0.60	0.60	-
56R	Borah 1	-	0.65	-
57R	Tunmallallee 1	0.5	0.59	-
58R	Pilliga 1	0.5	0.70	0.65-0.70
59R	Bohena 1	-	0.50	0.80
60R	Wee Waa 1	0.5	0.59	-
61R	Sandy Camp 1	0.4	-	-
PLATE 23	**ASHFORD BASIN**			
62R	Ashford	1.02	-	1.02
PLATE 23	**BOWEN BASIN**			
63R	Gil Gil 1	0.4	-	-
64R	Boomi 1	0.4	-	-
65R	Macintyre 1	0.4	0.7	-
66R	Goondiwindi 1	0.4	0.68	-
67R	Millmerran	0.50	-	-
68R	Ipswich	0.89	-	-
69R	Moonie 7	<0.48	-	-
70R	Alton 4	<0.74	-	-
71R	Southwood 1	<0.63	0.63	-
72R	Cabawin	<0.43	0.82	-
73R	Trinidad 2	<0.72	-	-
74R	Snake Creek 4	<0.73	-	-
75R	Sunny Bank 2	<0.72	-	-
76R	Wandoan 1	<0.40	1.23	-
77R	Burunga 1	<0.48	1.78	-
78R	Cockatoo Creek 1	0.61*	2.01	-
79R	Taroom 12	<0.71	>0.71	-
80R	Taroom 11	<0.84	>0.84	-
81R	Kia Ora 1	<0.72	0.72	-
82R	Westgrove 3	<0.49	0.75	-
83R	Eddystone 1	<0.63	0.70	-
84R	Taroom 10	<0.89	0.89	-
85R	Glenhaugton 1	<1.48	2.09	-
86R	Warrong 1	<0.56	<0.56	-
87R	Bandanna 1	<0.72	0.72	0.75
88R	Warrinilla 1	<0.65	0.75	1.27
89R	Buckland 1	<0.7	<0.7	-
90R	Sprinsure 5	<0.65	<0.69	0.69
91R	Rolleston 1	<0.60	0.51	2.02
92R	Purbrook 1	<0.74	0.86	1.30
93R	Theodore	0.6	0.6	-
94R	Nipan	0.7	0.7	-
95R	Moura	1.0	1.0	-
96R	Callide	0.51	-	-
97R	Baralaba	2.0	2.02	-
98R	South Blackwater	1.0	1.0	-
99R	South of Duaringa	2.0	2.0	-
100R	Leichhardt	1.0	1.1	-
101R	Dingo	2.2	2.2	-
102R	Blackwater	1.0	1.0	-
103R	Bluff	1.8	1.8	-
104R	Tolmies Shaft	1.1	1.1	-
105R	Comet	0.60	0.60	-
106R	Mammoth	1.32	1.32	-
107R	Yarrabee	2.6	2.6	-
108R	Gregory	0.8	1.0	-

Control point	Location and description	Reflectance (%) Surface	Upper Permian	Middle-upper Permian* and Lower Permian
108aR	Capella	0.73	-	0.73-1.50
109R	Oaky Creek	0.9	0.9	-
110R	German Creek	1.1	1.1	-
111R	Norwich Park	1.1	1.1	-
112R	-	2.33	2.33	-
113R	Saraji	1.0	1.0	-
114R	Peak Downs	1.0	1.0	-
115R	-	3.39	3.39	-
116R	Daunia	1.60	1.60	-
117R	Blair Athol	0.55	-	0.55
118R	Goonyella	1.08	1.08	-
119R	Kemmis Creek	1.28	1.28	-
120R	Newlands	<1.0	<1.0	-
121R	Collinsville	1.32	-	1.32
122R	Calen	>2.0	-	>2.0
PLATE 23	**GALILEE BASIN**			
123R	Buckland 3	<0.7	<0.7	-
124R	Tambo 3	<0.43	0.43	-
125R	Valetta 1	<0.40	>0.40	-
126R	Tambo 2	>0.57	>0.57	-
127R	Jericho 2	<0.54	<0.54	-
128R	Jericho 1	<0.59	0.60	-
129R	Hexham 1	<0.53	0.56	-
130R	Alice River 1	<0.55	0.55	-
131R	Coreena 1	<0.45	0.45	-
132R	Salten Creek 1	<0.39	0.39	-
133R	Aramac 1	<0.53	0.47	0.51
134R	Glenaras 1	<0.51	0.51	-
135R	Brookwood 1	<0.43	0.43	-
136R	Towerhill 1	<0.41	>0.41	-
137R	Hughenden 7	<0.52	1.00	-
138R	Hughenden 6	<0.38	0.38	-
139R	Yongala 1 & 2	<0.67	-	0.67
PLATE 23	**COOPER BASIN**			
140R	Chandos South 1	0.35	1.20	-
141R	Durham Downs 1	0.35	1.20	1.26
142R	Tallalia 1	0.35	-	1.80
143R	Roseneath 1	0.35	0.86	1.07
144R	Epsilon 2	0.35	1.06	-
145R	Innamincka 1	0.35	-	0.98
146R	Burley 1	0.35	2.8	6.6
147R	Dullingari 1	0.35	-	1.89
148R	Della 1	0.35	1.20	1.28
149R	Strzelecki 2	0.35	1.00	1.07
150R	Big Lake 1	0.35	1.60	3.30
151R	Moomba 3	0.35	1.1	2.90
152R	Mudrangie 1	0.35	0.75	1.10
153R	Tirrawarra 1	0.35	0.98	1.24
154R	Tindilpie 1	0.35	1.04	1.30
155R	Gidgealpa 1	0.35	0.94	1.06
156R	Wancoocha 1	0.35	0.68	0.70
157R	Weston 1	<0.4	<0.4	-
158R	Barrolka 1	0.35	-	1.33
159R	Mt Howitt 1	0.35	-	1.47
160R	Karmona 1	0.35	1.07	-
161R	Thunda 1	0.35	>0.72	-
162R	Bodalla 1	0.35	0.80	-
163R	Cumbroo 1	0.35	0.85	-
164R	Chandos 1	0.35	0.92	-
165R	Tanbar 1	0.35	>1.56(?)	-
166R	Bury 1	0.35	0.77	-
167R	Gilpeppee 1	0.35	0.83	-

CSIRO DATA BASE 2 - PART 1

LOCATION OF COAL QUALITY CONTROL POINTS

INTRODUCTION

The locations of control points used to characterise the several coal quality parameters discussed in Chapters 19 to 24 are shown in plates 30, 31 and 32. Sources of data for the Permian basins are shown in plates 33, 34, and 35. The control points, listed below are mainly exploration boreholes of the Geological Survey of Queensland (GSQ), New South Wales (GSNSW) or companies. CSIRO data relates mainly to sampling of operating mines over the last 25 years with the more recent inclusion of stratigraphically representative borehole samples. The more important representative control points which are presented in Part 2 of this data base, are cross-referenced to the listing below.

INDEX

Control Point	Description and location	Control Point	Description and location
PLATE 30	**BOWEN BASIN**	43Q	Cairns County NS61 & 62
		44Q	Cairns County NS11
1Q	Bowen River NS518	45Q	Cairns County NS10
2Q	Bowen River NS597	46Q	Saraji mine
3Q	Hillalong NS3 & 4	47Q	Cairns County NS24
4Q	Calen mine	48Q	Cairns County NS64 & 69
5Q	Newlands mine	49Q	Cairns County NS23
6Q	Drake NS18 & 24	50Q	Blair Athol mine & bore L17
7Q	Drake NS16	51Q	Clermont NS1
8Q	Eastern Creek mine	52Q	Cairns County NS67
9Q	Drake NS12	53Q	Cairns County NS14
10Q	Drake NS7	54Q	Cairns County NS5
11Q	Drake NS9 & 10	55Q	Cairns County NS38
12Q	Grosvenor NS2	56Q	Norwich Park mine
13Q	Grosvenor NS6	57Q	Cairns County NS33 &
14Q	Lake Elphinstone mine		Talbot NS69 & 70
15Q	Hail Creek mine	58Q	Cairns County NS8
16Q	Lenton Downs mine	60Q	German Creek mine, Talbot
17Q	Lake Elphinstone NS7R		NS69 & 70 & Utah 1384C
18Q	Wodehouse NS1 & 2	61Q	Blackwater NS123
19Q	Kemmis Creek mine & TS2	62Q	Talbot NS17 & 55 &
20Q	Bee Creek mine		Oaky Creek mine
21Q	Riverside mine	63Q	Talbot NS172R
22Q	GNS10	64Q	Blackwater NS163
23Q	Goonyella mine	65Q	Gregory mine
24Q	Grosvenor NS62	66Q	Talbot NS74
25Q	Walker Creek mine	67Q	Emerald NS44 & 46
26Q	St Albans NS25	68Q	Emerald NS80 & 77
27Q	South Walker mine	69Q	Emerald NS10, 31, 5R & 6
28Q	Broadmeadow, GNS14	70Q	Emerald NS25 & 30
29Q	Grosvenor NS14	71Q	Emerald NS2
30Q	Killarney NS2 & 3R	72Q	Emerald NS16
31Q	Grosvenor NS44 & 45	73Q	Denison NS41
32Q	Grosvenor NS10	74Q	Denison NS20
33Q	Poitrel mine	75Q	Emerald NS20 & 55
34Q	Grosvenor NS8	76Q	Denison NS15, & Emerald NS72
35Q	Rugby DDH2	77Q	Denison NS14
36Q	Grosvenor NS23 & 17	78Q	Denison NS18
37Q	Poitrel NS21R	79Q	GSQ Emerald 1
38Q	Poitrel NS19R	80Q	Leura NS45R
39Q	Killarney NS1	81R	Yarrabee mine & TMC102
40Q	Cairns County NS13	82Q	Blackwater NS168
41Q	Cairns County NS63	83Q	Leura NS25
42Q	Peak Downs mine	84Q	Blackwater NS9 & 11R

Control Point	Description and location	Control Point	Description and location
85Q	Humbolt NS215 & 216 & Blackwater NS35	143Q	Galilee NS29
		144Q	Galilee NS21
86Q	Blackwater NS73	145Q	Galilee NS10
87Q	Blackwater NS85	146Q	Degulla De14
88Q	Bluff mine & B88, 89 & 100	147Q	Galilee NS4 & 5
89Q	Blackwater NS94	148Q	Galilee NS1 & 3
90Q	Blackwater NS116	149Q	Galilee NS14 & 15R
91Q	Blackwater NS95	150Q	GSQ Jericho 1
92Q	Blackwater NS86		
93Q	Blackwater NS97	PLATE 32	**ASHFORD BASIN**
94Q	Blackwater NS102R		
95Q	Utah bore 216	151Q	Ashford area
96Q	Blackwater NS100		
97Q	Blackwater NS100 & Utah bore 1543	PLATE 32	**GUNNEDAH BASIN**
98Q	Utah bore 1542	152Q	DM Boggabri DDH1
99Q	BHP Blackwater 28	153Q	AMAX-BHP bore ABB 029
100Q	Blackwater NS102R	154Q	DM Emerald Hill DDH1
101Q	Sirius Creek mine	155Q	DM Wondobah DDH1 &
102Q	Sirius Creek O DDH5		Gollins Gunnedah DDH16
103Q	Togara NS38	156Q	DM Breeza DDH1
104Q	Denison NS21	157Q	DMR Howes Hill DDH1
105Q	Togara NS14	158Q	DM Caroona DDH1
106Q	A to P 10C	159Q	DM Caroona DDH2
107Q	Togara NS32		
108Q	Denison NS4	PLATE 32	**GLOUCESTER BASIN**
109Q	Denison NS1		
110Q	Theiss Co 70	160Q	Gloucester area
111Q	Buckland NS1		
112Q	GSQ Springsure 1	PLATE 32	**SYDNEY BASIN**
113Q	Consuelo NS1		
114Q	GSQ Taroom 8	161Q	Wancol Blandford DDH1
115Q	Consuelo NS3	162Q	Wancol Parkville DDH1,1A & 2
116Q	AAO Westgrove 1	163Q	DM Ellis DDH7
117Q	GSQ Taroom 11/11A	164Q	DM Lupton Park DDH2
118Q	Baralara NS14	165Q	DM Ellis DDH4
119Q	Baralaba NS24	166Q	Muswellbrook No.1 open
120Q	Moura NS57		cut & MCCD DDH2
121Q	Moura NS73	167Q	PA Mangoola DDH2
122Q	Moura 2293	168Q	JEM Mt Arthur DDH1,
123Q	Moura NS61 & 67		5,3,39,44 & 74
124Q	West Moura NS142 & 144R	169Q	Balmoral bores (A)1,
125Q	Moura 1294 & NS22		(D)21 & (S)8, 9, 10 & 11
126Q	Moura NS33	170Q	Liddell colliery DDH(S)1,
127Q	Moura NS45		2 & 3
128Q	Theodore NS37	171Q	Liddell SCM & DDH(S)5,
129Q	Theodore NS27 & 47R		6 & 7
130Q	Kiaora North 7,8 & 9	172Q	Foybrook East DDH25
131Q	Theodore NS42	173Q	DDH 52
132Q	Theodore NS14	174Q	Elecom Mt. Arthur
133Q	87C-LO2		DDH10, 12, 14 & 17
134Q	72C-RA33	175Q	Liddell DDH (S)7
135Q	72C-RA36R	176Q	Camberwell DDH(R)8
136Q	91C-W08	177Q	Nundah bore & Rix's
137Q	71C-665R		Creek bore DDH(R)4
138Q	89C-1002	178Q	Great Greta colliery
139Q	52C-889R	179Q	Wambo open cut
140Q	52C-890R	180Q	Warkworth bore (R)2,
PLATE 31	**GALILEE BASIN**		Armco Bulga DDH71 &
			DM Warkworth DDH12
		181Q	DM Warkworth DDH23
141Q	Galilee NS33/30	182Q	AOG Loder Dome No.1
142Q	Galilee NS24	183Q	Broke TS 1 & 2

Control Point	Description and location	Control Point	Description and location
184Q	Ayrfield No.3 colliery	232Q	Wancol Lithgow DDH24
185Q	Planet East Maitland 1		& Steelworks colliery
186Q	Buchanan Maitland	233Q	Coalex-BP Clarence DDH14
	Bloomfield & Bloomfield	234Q	DM Upper Colo DDH1
	South No.2 colls	235Q	Lithgow state coal mine
186aQ	Tipton colliery	236Q	Hassans Walls colliery &
187Q	Dagworth Greta colliery		Coalex Lithgow Valley DDH1
187aQ	Kent colliery	237Q	Hartley Main colliery
187bQ	DMR Stockton DDH3	238Q	Wancol Mt Tomah DDH1
188Q	Hebburn No.2 & Stanford	239Q	Mulgoa No.2 bore
	Main No.1 colls	240Q	DM Cape Banks 1
189Q	Pelton & Aberdare	241Q	DM Cobbity DDH4
	Extd colls	242Q	DM Werombi DDH2
190Q	Stockington No.2 colliery	243Q	DM Cobbity DDH2
191Q	Mt Sugarloaf colliery	244Q	Oakdale state coal mine
192Q	Northern & Stockton	245Q	Nattai Bulli colliery
	Borehole colls & Stockton	246Q	Clutha Burragorang
	Borehole DDH2		DDH57, 65, 97 & 101
193Q	Northern & Northern	247Q	Wollondilly Extd coll
	Extd colls	248Q	Valley No.1 & 2 colls
194Q	Newstan deep bores DDH1 & 2	249Q	DM Cobbity DDH3
	Newstan No.1 colliery	250Q	DM Cobbity DDH1
195Q	Waratah No.2 & Burwood colls	251Q	DM Campbelltown DDH5
196Q	John Darling colliery	252Q	DM Campbelltown DDH3
197Q	Belltop & Belmont North colls	253Q	DM Campbelltown DDH4
198Q	John Darling colliery	254Q	DM Campbelltown DDH1
199Q	Awaba state coal mine	255Q	DM Camden DDH66
200Q	DM Cooranbong DDH1	256Q	AIS Appin No.9 bore
201Q	DM Murrays Run DDH1	257Q	DM Camden DDH61
202Q	DM Brush Creek DDH1	258Q	Metropolitan colliery
203Q	DM Jilliby Creek DDH1	259Q	Coalcliff & South
204Q	DM Dooralong DDH1		Clifton colls
205Q	Normaine & Wallamaine colls	260Q	Iluka DDH21
206Q	South Wallarah DDH3 &	261Q	DM Wilton DDH1
	Wyee state coal mine DDH1	262Q	DM Wollongong 27
207Q	Wyee state coal mine	263Q	Wollongong E bore
208Q	South Wallarah DDH3	264Q	AIS Bulli No.13 bore
209Q	South Wallarah DDH2 &	265Q	Excelsior No.2 colliery
	Newvale No.1 colliery	266Q	Bulli Main colliery
210Q	Elecom Wyong DDH10	267Q	Austinmeer Central &
211Q	Longley DDH1		Excelsior No.2 colls
212Q	Streven's Terrigal 1	268Q	South Bulli colliery
213Q	Shell Dural South 1	269Q	DM Cordeaux DDH1
214Q	Lennox Ulan DDH 2 & 3	270Q	Kemira colliery
215Q	DM Bylong DDH3	271Q	Nebo colliery
216Q	DM Goulburn Valley DDH2	272Q	Kembla Mountain No.1 bore
217Q	DM Goulburn Valley DDH1	273Q	AIS Wongawilli No.11 bore
218Q	DM Baramei Creek DDH1	274Q	Mount Murray DDH10 & DDH11
219Q	DM Bylong DDH1	275Q	Huntley & Avondale colls
220Q	DM Widden DDH2	276Q	Tongarra colliery
221Q	Kandos No.2 colliery	277Q	Wanganderry colliery
222Q	Clandulla colliery	278Q	South Main colliery
223Q	DMR Kelgoola DDH3	279Q	Mt Misery DDH1
224Q	DM Howes Valley DDH1	280Q	Berrima colliery
225Q	Wancol Putty DDH1	281Q	Black Bob's Creek
226Q	Wancol Newnes DDH1		heading No.3
227Q	Wancol Newnes DDH2	282Q	Clyde River Gorge
228Q	Wancol Lithgow DDH14 & 19		- old workings
229Q	Ben Bullen open cut		
230Q	Redsprings open cut	PLATE 32	**OAKLANDS BASIN**
	& Coalex WCD DDH2 &		
231Q	Wancol Lithgow DDH2	283Q	Oaklands area

CSIRO DATA BASE 2 - PART 2

COAL QUALITY CONTROL POINTS

INTRODUCTION

This data base was prepared during the Permian Coals Project to provide representative stratigraphic and geographic coverage of coal quality parameters in the Permian Basins, mainly at the seam composite level. Several parameters in the data base; vitrinite - % mmf, total sulphur - % daf, phosphorus - % db, ash content - % db and ash composition - SiO_2:Al_2O_3 ratio, were subsequently averaged for several stratigraphic intervals to produce the lateral variation maps discussed in Chapters 19, 20, 21 and 22 of the report. The data base is concentrated mainly in the Sydney and Bowen Basins, which contain the more accessible deposits and where most of information is available because of current exploitation of the coal resource. Data from a few bores in the Gunnedah Basin, several bores along the eastern side of the Galilee Basin, and a few bore or mine samples in each of the Blair Athol, Wolfang, Ashford, Cranky Corner and Oaklands Basins are also included.

SOURCES OF DATA

The source of the petrographic and chemical data is indicated in an abbreviated form, usually

CSIRO LR117 - CSIRO Location Report 117
CSIRO IR50 - CSIRO Investigation Report 50
CSIRO IR1423R - CSIRO Investigation Report 1423 Restricted
CSIRO TC39 - CSIRO Technical Communication 39
GSQ Record 1980/17 - Geological Survey of Queensland Record 1980/17 (unpub.)
QGMJ '78 - Queensland Government Mining Journal, 1978 (unpub.)
GSNSW GS1976/219 - Geological Survey of NSW Record 1976/219 (unpub.)

Data appearing in Australian Black Coals (Joint Coal Board (JCB) and Queensland Coal Board (QCB) 1976) and Queensland Coals (QCB 1978) may also appear. Data derived from unpublished proprietary sources is usually identified by the company name and appears with permission, for example:

AMAX-BHP or Wancol-BP Coalex. Data attributed solely to CSIRO and CSIRO IR's 1414R, 1394R, 1397R and 1375R, were generated for the Permian Coals project.

SAMPLES

Abbreviations used in describing samples are set out as follows:

Type of Sample

CCC	clean coal composite, section excluding mineral matter bands >5 or 10 mm thickness, depending on the age of the data - mainly CSIRO data.
RC	raw coal, section including mineral matter bands (sometimes excluding major bands ? >30 cm).
1.60F	1.60 relative density float fraction
1.60S	1.60 relative density sink fraction

Portion of Sample

WS	whole seam
MS	main seam or middle split - excluding an upper or lower split or both
US	upper section or upper split
LS	lower section or lower split
(sub)A	subsection "A"

Sample Number

LN35697	CSIRO laboratory number
PN7274	CSIRO petrographic number
PS1250	GSQ petrographic section
RC11693	GSQ laboratory number
6729	Company number as reported.

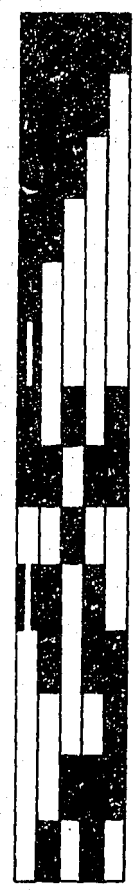
In some cases no sample numbers are available and the data is set out as reported.

PETROGRAPHIC ANALYSES

Petrographic analyses are reported on a volume % basis, excluding GSQ microscopic analyses which are reported on a weight % basis by recalculating mineral matter to agree with % ash in the proximate analysis.The microscopic analyses are reported at the group level because of variation in detail reported within and between organisations.

Petrographic Profiles

The macropetrographic profiles have been "standardised" to the Australian Standard (1970) scheme, modified to allow for several other categories routinely used by GSQ and GSNSW. The minimum bandwidth shown in the profiles is 50 mm (nib size 0.5 mm at a scale of 1:100) although much of the original data was already smoothed to 500 mm or 1 m subsections. Many data have been reinterpreted by using a correlation between the old macropetrographic categories, vitrinite content, and the new macropetrographic categ ries. A key to the macropetrographic categories used in the data base is set out below.The categories D and Dmb often are not differentiated in which case Dmb is shown.



Symbol	Description		% Brights	% Vitrinite (mmf)
B	- Bright	<35% ash	>90	≑ 75
Bd	- Bright banded		60-90	≑ 70
DB	- Interbanded		40-60	≑ 50
Db	- Dull banded		10-40	≑ 45
Dmb	- Dull minor bright		1-10	≑ 25
D	- Dull		<1	≑ 10
Coal	- cindered			
Coal	- undifferentiated			
Coal	- weathered			
Dull coal and carb. shale				
Bright coal and carb. shale				
Mineral > coal		>35% ash		
Coal > mineral				
Carb. shale				

Microlithotype Analyses

Microlithotype analyses which originate mainly within the CSIRO are based on ICCP (1963 and 1971) definitions and were made by the "line method". They are reported using the following groupings

V + C	vitrite + clarite	
VI + CD + DC	vitrinertite + clarodurite + duroclarite	intermediates
I	inertite + durite	
SC + MM	shaly coal + mineral matter	

Maceral Analyses

Maceral analyses originating mainly in CSIRO and GSQ are based on ICCP (1963 and 1971) definitions, and are reported using the following groupings

V + E	vitrinite + exinite
I	inertinite
MM	mineral matter

Reflectance Analyses

Reflectance is reported as R_o max, mainly for vitrinite "A" (collinite + telocollinite) although this is often not stated in the source material.

CHEMICAL ANALYSES

Recovery, Weight % and Relative Density

Recovery refers to the estimated volumetric recovery in the bore coal. Weight % refers to the % of float material recovered in a density separation. Recovery and relative density (specific gravity) are only sporadically reported for older data.

Proximate Analysis

Moisture (M), ash (A) and volatile matter (VM) are determined and fixed carbon (FC) is calculated. VM and FC have been calculated to a dry ash free basis (daf) using the factor (100-[M+A]).

Ultimate Analysis

Carbon (C), hydrogen (H), nitrogen (N) and sulphur (S) are determined and oxygen (O) is calculated. In most cases CSIRO data is adjusted for inorganic carbon (CO_2) and (pyritic + sulphate (P+S) sulphur (S). Where these analyses are not shown the adjustments probably have not been made. The ultimate analyses have been calculated to a daf basis using the factor (100-[M+A]).

Specific Energy

Specific energy is reported as gross specific energy and in many cases was originally reported as calorific value. It has been converted to a daf basis using the factor (100-[M+A]).

Cruicible Swelling Number

Crucible swelling number (CSN) is a measure of agglomeration and swelling as a result of fast heating and is widely reported.

Total Sulfur and Forms of Sulfur

Total sulfur (TS), pyritic and sulfate sulfur (P+SS) are determined directly and organic sulfur (OS) is calculated. Sulfur is reported on a daf basis using the factor (100-[M+A]). Forms of sulfur are reported mainly by the CSIRO, JCB and QCB).

Phosphorus and Fluorine

Phosphrus (P) is reported on an air dry (ad) coal basis, and may be determined directly or calculated from an ash analysis. Phosphorus is widely reported. Fluorine (F) is reported mainly in recet analyses of the GSQ.

Chlorine, Arsenic and Carbon Dioxide

Chlorine (Cl) and arsenic (As) originate mainly in the CSIRO data bank, but chlorine is routinely reported by the JCB and QCB. Carbon dioxide (CO_2) originating in carbonates is widely reported in conjunction with organic carbon.

Ash Analysis

Analyses of oxides in coal ash are widely reported. Only SiO_2 and Al_2O_3 are shown in the data base.

Trace Elements

Only boron (B) and gallium (G) (ppm air dry coal basis) are shown in the data base. The data originate in the CSIRO and were determined by a semi-quantative spectrographic D.C. arc emission method.

REFERENCES

International Committee for Coal Petrology (ICCP), 1963. International Handbook of Coal Petrology 2nd Edition and ICCP, 1971, Supplement, CNRS Paris.

Joint Coal Board and Queensland Coal Board, 1979. Australian Black Coals, revised. Pub. Hogbin, Poole (Printers) Pty Ltd

Queensland Coal Board, 1978. Queensland Coals, 6th Edition.

Standards Association of Australia, 1970. Graphical Representation of Coal Seams. Australian Standard K183-1970.

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116Q	Injune, AAO Westgrove No.1	1
PLATE 30	**BLAIR ATHOL AND WOLFANG BASINS**	
	Blair Athol Coal Measures	
50Q	Blair Athol, bore L17	1
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PLATE 30	**BOWEN BASIN**	
	Collinsville Coal Measures	
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2Q	Collinsville, Bowen River NS597	3
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	Ashford Coal Measures	
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PLATE 32	**GUNNEDAH BASIN**	
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153Q	Boggabri, Amax-BHP bore ABB 029	4
161Q	Wingen, Wancol Blandford DDH1	5
156Q	DM Breeza DDH1	5
154Q	DM Emerald Hill DDH1	5
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189Q	Cessnock, Pelton & Aberdare Extd colls	7
184Q	Branxton, Ayrfield No.3 colliery	7
166Q	Muswellbrook, Muswellbrook No. 1 open cut	7
166Q	Muswellbrook, Muswellbrook Coal Co. Development DDH2	8
182Q	Singleton, AOG Loder Dome No.1	8
188Q	Kurri Kurri, Hebburn No.2 & Stanford Main No.1 colls	9
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43Q	Peak Downs South, Cairns County NS71 & 62	12
40Q	Peak Downs North, Cairns County NS13	13
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36Q	Moranbah, Grosvenor NS23 & 17	18
22Q	Red Hill, Grosvenor NS10 & 37R	18
12Q	Lenton Downs, Grosvenor NS2	19
3Q	Exmoor, Hillalong NS3 & 4	19
28Q	Broadmeadow, Grosvenor NS14	20
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71Q	Emerald, Emerald NS2	20
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13Q	Lenton Downs, Grosvenor NS6 & 3	
19Q	Kemmis Creek, Kemmis Creek TS No.2 & NS9	22
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7Q	Newlands, Drake NS16	23
17Q	Lake Elphinstone NS7R	23
30Q	Annandale, Killarney NS2 & 3R	23
33,37Q	Poitrel, Poitrel NS21R	24
38Q	Poitrel, Poitrel NS19R	24
26Q	St Albans, St Albans NS25	24
32Q	Annandale, Grosvenor NS10	24
53Q	Picardy, Cairns County NS14	25
58Q	Roper Creek, Cairns County NS8	25
54Q	Roper Creek East, Cairns County NS5	25
59Q	Roper Creek East, Roper NS1 & 2	26
64Q	Girrah, Blackwater NS163	26
81Q	Yarrabee, Minad TMC102	27
88Q	Bluff, Minad boreholes B98, B99 & B100	27
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49Q	Picardy, Cairns County NS23	28
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84Q	Blackwater, Blackwater NS85	29
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28Q	Broadmeadow, Broadmeadow NS14	29
102Q	Sirius Creek, borehole O DDH5	30
101Q	Sirius Creek, No.1 mine	30
93Q	Blackwater, Blackwater NS97	30
95Q	Blackwater, Utah bore 216	30
92Q	Blackwater, Blackwater NS86	30
105Q	Togara, Togara NS14	31
103Q	Togara, Togara NS38	31
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82Q	Blackwater, Blackwater NS168	31
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99Q	Blackwater, BHP Blackwater No. 28 bore	32
89Q	Blackwater, Blackwater NS94	32
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71,72Q	Emerald, Emerald NS2 & 16	33
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78Q	Springsure, Denison NS18	33
77Q	Emerald, Denison NS14	33
76Q	Emerald, Denison NS15 & Emerald NS72	34
70Q	Emerald, Emerald NS25 & 30	34
104Q	Springsure, Denison NS21	34
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110Q	Springsure, Buckland NS1	35
110Q	Rolleston, Theiss CO70	35
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119Q	Baralaba, Baralaba NS24	36
122Q	Banana, Moura borehole No. 2296	36
121Q	Banana Creek, Moura NS73	37
124Q	West Moura, West Moura NS144R	37
123Q	Moura No.1 - Mungi, Moura NS61 & 67	38
124Q	West Moura, West Moura NS142 & 142A	38
120Q	Banana Creek, Moura NS57	39
125Q	Moura, Moura borehole 1294	39
125Q	Moura No.1 mine, Moura NS22	40
129Q	Theodore, Theodore NS27/47R	40
126Q	Kianga-Moura, Moura NS33	41
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145Q	Laglan, Galilee NS10	44
149Q	Lambton Meadows, Galilee NS14/15R	44
144Q	Moray Downs, Galilee NS21	45
150Q	Lambton Meadows, GSQ Jericho 1	45
143Q	View Hill, Galilee NS29	46
141aQ	Pentland, Galilee NS35R	47
142Q	Mirtna, Galilee NS24	47
141Q	Longton, Galilee NS33 & 30	48
146Q	Degulla, Degulla bore De14	48
PLATE 32	**GUNNEDAH BASIN**	
	Black Jack Formation	
157Q	Caroona, Howes Hill DDH1	49
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PLATE 32	**SYDNEY BASIN**	
	Tomago Coal Measures	
186,187Q	Maitland, Buchanan Maitland & Dagworth Greta colls	50
186Q	Maitland, Bloomfield South No. 2 colliery	50
187aQ	Beresfield, Kent colliery	50
187Q	Maitland, Bloomfield colliery	50
186aQ	Maitland, Tipton colliery	51
	Newcastle Coal Measures	
208Q	Wyee, South Wallarah DDH5	51
191a,192aQ	Adamstown, Boston No.2 & Borehill colls	51
196,198Q	North Belmont, Belmont North, Belltop & John Darling colls	52
205Q	Swansea, Wallamaine & Normaine colls	52
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209Q	Vales Point, South Wallarah DDH2 & Newvale No.1 colliery	55
192Q	West Wallsend, BHP Stockton Borehole DDH2	55
207Q	Chain Valley, Wallarah colliery	56
199Q	Awaba, Awaba state coal mine	56
190,191Q	West Wallsend, Mt. Sugarloaf & Stockrington No.2 colls	56
210Q	Wyong, Elecom Wyong DDH10	57
194Q	Wakefield, Newstan deep bore DDH1	57
206,207Q	Mannering Park, South Wallarah DDH3 & Wyee state coal mine DDH1	58
194Q	Wakefield, Newstan No.1 colliery & Newstan deep bore DDH2	58

Control point	Location and description	Page
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183Q	Broke, Broke Prospecting Area TS No.1 & 2	60
170Q	Foybrook & Liddell colls & DDH(S)1, 3 & 4	61
175Q,171Q	Howick coll., Liddell scm & DDH(S)5, 6 & 7	61
167Q	Denman, PA Mangoola DDH2	61
176Q	Camberwell, DDH(S)2 & Camberwell DDH(R)8	62
213Q	Dural, Shell Dural South No.1	63
	Illawarra Coal Measures	
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273Q	Unanderra, AIS Wongawilli No.11 bore	63
258Q	Stanwell Tops, Metropolitan colliery	63
248Q	Oakdale, Valley No.2 colliery	64
248Q	Oakdale, Valley No.1 colliery	64
247Q	Oakdale, Wollondilly Extd colliery	64
244Q	Oakdale, Oakdale scm	64
245Q	Oakdale, Nattai Bulli colliery	64
239Q	Mulgoa No.2 bore	64
265Q	Bulli, Excelsior No.2 colliery	65
264Q	Bulli, AIS Bulli No.13 bore	65
268Q	Bulli, South Bulli colliery	65
256Q	Appin, AIS Appin No.9 bore	65
267Q	Austinmeer, Austinmeer Central & Excelsior No.2 colls	65
263Q	Wilton, Wollongong E bore	66
255Q	Campbelltown, DM bore 66 (Camden)	66
259Q	Coalcliff, South Clifton colliery	67
270Q	Corrimal, Kemira colliery	67
275Q	Unanderra, Huntley & Avondale colls	67
272Q	Unanderra, Kembla Mt. bore DDH1	67
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262Q	Tahmoor, DM bore 27 (Wollongong)	68
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276Q	Albion Park, Tongarra colliery	69
271Q	Unanderra, Nebo colliery	69
281Q	Berrima, Black Bobs Creek heading No.3 & Southern colliery	70
279Q	Berrima, Mount Misery DDH1	70
278Q	Mittagong, South Main colliery	70
277Q	Mittagong, Wanganderry colliery	70
280Q	Berrima, Berrima colliery	70
223Q	Rylstone, DMR Kelgoola DDH3	71
225Q	Putty, Wancol Putty DDH1	71
234Q	Colo, DM Upper Colo DDH1	71
228Q	Newnes, Wancol Lithgow DDH14 & 19, Newnes DDH2 & 1	72
233Q	Clarence, Wancol Lithgow DDH16 & Coalex BP Clarence DDH14	72
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229Q	Portland, Ben Bullen open cut	74
232Q	Lithgow, Steelworks colliery	74
221Q	Kandos, Kandos No.2 colliery	74
236Q	Hassans Walls & Hartley Main colls & Coalex Lithgow Valley DDH1	75
235Q	Lithgow, Lithgow state coal mine & Dobbs drift	75
222Q	Kandos, Clandulla colliery	75
323Q	Lithgow, Wancol Lithgow DDH24	76
PLATE 32	**OAKLANDS BASIN**	
	Corrabin Coal Measures	
283Q	Oaklands, Oaklands bore DDH15	76

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BOWEN BASIN
REIDS DOME BEDS
LOCATION: Injune
Taroom 11/11A

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Reids Dome Beds	298 69			QGMJ 78
Seam 1	70		5·08	
	303·77 426·85			
Seam 2.	76		12·46	
	to 438 99			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM
rc	PS1248 +1249	CSIRO		44	34 ave 36	12	5
ws	5·08			51	36	13	
rc	PS1250 -1252			44	30 ave 33	13	8
ws	12·46			53	33	14	

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM
rc	PS1248 +1249	QGMJ 78		62 wmf 70	27 wmf 30	11
ws	5·08					
rc	PS1250 -1252			65 wmf 76	21 wmf 24	14
ws	12·46					

REFLECTANCE

Sample type	Sample Number	Source	R_o max
rc	PS1248 +1249	QGMJ 78	0·60
ws	5·08		
rc	PS1250 -1252		0·65
ws	12·46		

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
rc	PS1248 +1249	QGMJ 78		1·33
ws	5·08			
rc	PS1250 -1252			1·37
ws	12·44			

PROXIMATE wt % ad

M	A	VM	FC
5·1	10·5 db 11·1	35·2 daf 41·7	49·2 68·3
4·6	13·9 db 14·6	33·0 daf 40·8	48·5 59·5

ULTIMATE wt % ad

C	H	O	N	S
69·3	5·0	7·8 daf 9·3	1·7 2·0	0·7 0·8
67·4	4·5	7·4 daf 9·1	1·7 2·1	0·5 0·6

SE MJ/kg	CSN
28·92 daf 34·27	
27·72 daf 34·01	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·69 daf 0·78			0·07				6·09
0·53 daf 0·60			0·06				0·59

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BOWEN BASIN
REIDS DOME BEDS
LOCATION: Injune
AAO Westgrove No 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Reids Dome Beds	1268 50			QGMJ 78
	53		3·00	
	1271 50			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM
ply	PS1287 ~3·00m	CSIRO		30	45 wmf 46	24	1
				30		24	
					random		

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM
ply	PS1287 ~3·00	QGMJ 78		57 wmf 60	38 wmf 40	5
	subsection					

REFLECTANCE

Sample type	Sample Number	Source	R_o max
ply	PS1287 ~3·00	QGMJ 78	0·90

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
ply	PS1287 ~3·00	QGMJ 78		1·32

PROXIMATE wt % ad

M	A	VM	FC
2·1	6·0 db 6·7	31·7 daf 34·5	60·2 65·5
	random		

ULTIMATE wt % ad

C	H	O	N	S
77·5	6·0	6·5 daf 7·1	1·6 1·7	0·4 0·4
	subsection.			

SE MJ/kg	CSN
	2

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·36 daf 0·41							0·41

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BLAIR ATHOL BASIN
BLAIR ATHOL COAL MEASURES
LOCATION: Blair Athol
Bore L 17

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Blair Athol Coal Measures	41 68			CSIRO TC 39
Big seam	27		26 91	
	67 59			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM
ccc		CSIRO TC 39	98	12	30 ave 58	tr	
ws	24 50			12	30	58	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM
1 Zn		CSIRO TC 39		71	29	tr
ws				71	29	

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
ccc		CSIRO TC 39	98	1·41
ws	24 50			
1 Zn				1·75

PROXIMATE wt % ad

M	A	VM	FC
5·2	7·2 db 7·6	27·8 daf 31·7	59·8 68·3
	1·3 db 1·4	33·8 daf 37·4	57·4 62·9

ULTIMATE wt % ad

C	H	O	N	S
72·1	4·1	9·7 daf 10·9	1·6 1·9	0·1 0·1
74·9	4·5	10·0 daf 11·0	1·6 1·8	0·2 0·2

SE MJ/kg	CSN
29·63 daf 32·77	½
30·40 daf 33·35	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·16 0·18	0·09 daf 0·10	0·07 0·08	0·009		0·01	6	0·34
0·22 0·24	0·02 daf 0·01	0·21 0·23	0·008		0·01		0·10

ASH

SiO_2 %	Al_2O_3 %
61·0 22·2	28·2 3·3

TRACE

B ppm ad	Ga ppm ad
3·0	2

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN WOLFANG BASIN
BLAIR ATHOL COAL MEASURES
LOCATION: Wolfang
Clermont NS 1 and 20

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN WOLFANG BASIN
BLAIR ATHOL COAL MEASURES
LOCATION: Wolfang
Clermont NS 1 and 20

PETROGRAPHIC ANALYSES — MACROSCOPIC, MICROLITHOTYPE - VOL %, MACERAL - WT %, REFLECTANCE

CHEMICAL ANALYSES — PROXIMATE wt % od, ULTIMATE wt % od, MINOR wt % od, ASH, TRACE

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	S P+S	S O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm od	Ga ppm od
Blair Athol Coal Measures — Big seam equivalent	134.58																																															
	NS2D 48		2.32	GSQ Record 1980/17	ws	PS1701	CSIRO this study	77	52	30	17	1	ws	PS1701	GSQ Record 1980/17	77	67	30	3		PS1701		0.65	ws	RC11707	GSQ Record 1980/17	77	1.33	7.1	3.3	33.2	56.4						29.69 daf		0.42 daf			0.007							
					rc	2.32			53	30	17		rc	2.32			69	31						rc	2.32				5.6	37.1	42.9						33.14		0.41										
	136.70																																															
	134.19																																															
	73		3.44		us	PS1695		100	62	31	17	2	us	PS1695		100	69	25	6		PS1695		0.70	us	RC11688		100	1.36	7.5	9.5	31.1	59.4						28.63 daf		0.36 daf			0.20							
					rc	3.34			53	30	17		rc	3.34			75	27						rc	3.34				5.9	35.7	64.3						32.91		0.41										
	64		2.18			PS1696		100	18	7	6	69		PS1696		100	19	10	71						RC11689		100	2.06	2.1	10.7	11.7	75.5						7.44 daf		0.30 daf			0.009							
					rc	2.18			59	22	19		rc	2.18			66	34						rc	2.18				12.2	43.0	57.0						27.35		1.10										
	37		26.85		ws	PS1697		97	14	36	49	1	ws	PS1697		97	35	60	5					ws	RC11640		97	1.36	5.9	5.0	28.1	61.0						29.42 daf		0.31 daf			0.013							
					rc	26.85			14	36	50		rc	26.85			37	63						rc	26.85				5.3	31.9	68.5						33.62		0.39										
	48		11.55		is	PS1698		83	13	23	58	6	is	PS1698		83	42	46	12					is	RC11691		83	1.42	4.8	12.0	27.3	55.9						27.43 daf		0.31 daf			0.023							
					rc	11.55			14	25	61		rc	11.55			48	52						rc	11.55				2.6	32.6	67.2						32.97		0.31										
	179.51 (181.7)																																															
	39		0.89		ws	PS1699		100	20	18	50	12	ws	PS1699		100	33	51	16					ws	RC11692		100	1.44	4.0	15.8	26.2	54.0						26.69 daf		0.38 daf			0.004							
					rc	0.89			23	20	57		rc	0.89			39	61						rc	0.89				16.5	32.7	67.3						33.22		0.47										
	182.66																																															
	191.37																																															
	49		2.31		ws	PS1700		100	22	22	39	17	ws	PS1700		100	36	37	27					ws	RC11693		100	1.55	3.5	26.7	24.2	45.6						22.52 daf		1.23 daf			0.009							
					rc	2.31			27	27	46		rc	2.31			49	51						rc	2.31				27.7	34.7	65.3						32.26		1.76										
	193.66																																															

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BOWEN BASIN
COLLINSVILLE COAL MEASURE EQUIVALENTS
LOCATION: Clermont
Rugby DDH 2

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BOWEN BASIN
COLLINSVILLE COAL MEASURE EQUIVALENTS
LOCATION: Clermont
Rugby DDH 2

PETROGRAPHIC ANALYSES — MACROSCOPIC, MICROLITHOTYPE - VOL %, MACERAL - WT %, REFLECTANCE

CHEMICAL ANALYSES — PROXIMATE wt % od, ULTIMATE wt % od, MINOR wt % od, ASH, TRACE

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	S P+S	S O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm od	Ga ppm od
Collinsville C.M. Equivalent	132.05																																															
	37		8.18	QGMJ 71	ws	SubsA-D	QGMJ 71						ws	SubsA-D	QGMJ 71		32	54	14	rc	SubK	QGMJ 71	1.04	ws	SubsA-D	QGMJ 71			1.0	13.6	27.8	57.6						29.28 daf	2										
					rc	8.18							rc	8.18			37	63						rc	8.18				13.7	32.6	67.4						34.29											
	140.13				us	SubsA-F	QGMJ 71																																												
					rc	4.24																																													

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BOWEN BASIN
COLLINSVILLE COAL MEASURES
LOCATION: Collinsville
Bowen River NS 597

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Collinsville Coal Measures – Upper – Murray seam	292.30			
	500.24 / 338.06			
Garrick seam	62		2.26	QGMJ 77
	340.32 / 347.85			
Peace seam	53		1.07	
	348.92 / 406.93			
Scott seam	53		1.07	
	408.00 / 416.06			
Denison seam	73		0.99	
	417.05 / 427.20			
Potts seam	41		0.55	
	423.74 / 452.54			
Collinsville Coal Measures – Lower – Bowen seam	49		4.14	
	456.67 / 503.67			
Blake seam	22		6.02	
	525.69 / 614.06		4.36	

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc'	LN14002	CSIRO LR 338		28	26 (mmf)	39	7
ws'	2.26			30	28	42	
ccc'	LN18803			36	25 (mmf)	35	4
ws'	0.97			38	26	36	
			coked				
ccc'	LN14004			40	25 (mmf)	22	13
ls'	1.01			46	29	25	
ccc'	LN14007			45	26 (mmf)	19	10
	1.98			60	29	21	
ccc'	LN14171			10	14 (mmf)	52	24
	1.07			13	18	69	
B	LN14072			17	9 (mmf)	39	35
	0.38			26	14	60	
E	LN14075			42	5 (mmf)	4	49
	0.18			22	10	8	
ccc'	LN14140			21	18 (mmf)	44	17
ws'	5.06			25	22	53	
ccc'	LN14267			11	17 (mmf)	53	19
ws'	4.60			14	21	65	

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
rc'	PS8	QGMJ 77		53	33 (mmf)	14
ws'	2.26			62	38	
rc'	PS182			50	44 (mmf)	6
ws'	1.07			53	47	
rc'	PS183			40	35 (mmf)	25
ws'	1.07			53	47	
rc'	PS184			60	22 (mmf)	18
ws	0.99			73	27	
rc'	PS185			27	39 (mmf)	34
ws'	0.55			41	59	
rc'	PS26			41	42 (mmf)	17
ws	4.14			44	51	
rc'	PS112-21			19	64 (mmf)	17
ds	6.02			23	77	
160F	PS133			25	61 (mmf)	14
ds'	6.02			29	71	
rc'	PS112-31			17	60 (mmf)	23
ws'	10.38			22	88	
rc'	PS122-31			15	54 (mmf)	31
ls	4.36			22	88	
160F	PS135			25	57 (mmf)	18
ls'	4.36			30	70	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
		QGMJ 77	

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
rc'	GS1051166			1.42
ws	2.26			
160F	GS1037166		88	
ws'	2.26			
rc'	RC435			1.35
ws'	1.07			
rc'	RC436			1.67
ws'	1.07			
rc'	RC437			1.56
ws'	0.99			
rc'	RC438			1.66
ws'	0.55			
rc'	RC1073	QGMJ 77		1.44
ws'	4.14			
rcc'	GS1719-66			1.55
ds'	6.02			
160F	GS1718		93	1.44
ds'	6.02			
rc'	GS1718-19			1.57
ws'	10.38			
rc	GS1719-66			1.60
ls	4.36			
160F	GS1719		67	1.48
ls'	4.36			

PROXIMATE wt % ad

M	A	VM	FC
1.0	13.6 db / 23.5 daf	61.9 daf	
	19.1	27.5	72.5
0.8	7.4 db / 7.9 daf	25.0 daf	68.6
	7.9	25.1	74.9
1.3	6.9 db / 6.0	24.2 daf	68.6
	6.0	26.1	73.9
1.5	24.6 db / 25.0	20.4 daf	53.5
	25.0	27.8	72.4
1.3	18.1 db / 18.3	24.7 daf	55.9
	18.3	30.6	69.4
1.4	33.7 db / 34.2	18.2 daf	46.7
	34.2	28.0	72.0
1.4	16.7 db / 16.9	19.4 daf	62.5
	16.9	23.7	76.3
1.1	17.0 db / 17.2	21.0 daf	60.9
	17.2	25.6	74.4
1.0	14.3 db / 14.4	17.7 daf	67.0
	14.4	20.4	79.1
1.1	24.7 db / 25.0	18.9 daf	55.4
	25.0	25.3	74.7
1.2	34.9 db / 35.3	16.0 daf	47.9
	35.3	25.0	75.0
1.1	18.0 db / 18.2	17.1 daf	63.8
	18.2	21.1	78.9

ULTIMATE wt % ad

C	H	O	N	S
79.9	4.4	4.8 daf	1.7	1.7
86.1	5.0	5.2	1.9	1.8
84.3	4.3	4.2	1.2	8.8
73.6	4.6	8.5	1.6	11.9
84.3	5.0	6.8	1.8	2.1
51.5	4.2	15 daf	2.1	2.7
79.4	6.4	6.9	3.2	4.1
68.9	3.2	13.0 daf	1.7	1.0
71.9	3.8	21.2	2.0	1.1
70.0	3.8	5.0 daf	1.6	0.6
86.5	4.7	6.1	2.0	0.7

SE MJ/kg	CSN
33.14 daf / 36.10	9
33.21 daf	8
33.78	
23.45 daf / 31.73	3
27.64 daf / 34.29	8
21.63 daf / 33.33	1½
28.85 daf / 35.22	6½
28.69 daf / 35.03	1½
29.76 daf / 35.14	1½
26.31 daf / 35.52	
23.12 daf / 36.18	1½
28.50 daf / 35.23	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
7 3.38 daf / 3.41							
9 1.20 daf / 1.34			0.015		0.00		
8 1.44 daf / 1.79							
3 8.76 daf / 11.85							
8 1.68 daf / 2.08							
1½ 2.67 daf							
6½ 1.52 daf / 1.86			0.050		130		
1½ 1.31 daf / 1.60			0.300		0.02		0.04
1½ 0.95 daf / 1.12			0.036				
0.95 daf / 1.28			0.220		0.02		0.06
1½ 0.47 daf / 0.74			0.107		0.02		0.09
0.56 daf			0.115				

ASH

SiO_2 %	Al_2O_3 %
34.8	21.9
17	1.1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN BOWEN BASIN
COLLINSVILLE COAL MEASURES
LOCATION: Collinsville
Bowen River NS 518

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Collinsville Coal Measures – Upper – Murray seam	110.18		0.11	
	110.40 / 143.22			
Garrick seam	44		2.26	
	148.49 / 152.55			
Peace seam	51		0.97	
	158.83 / 209.73			
Scott seam	60		1.01	CSIRO LR 338
	212.94 / 216.90			
Denison seam	64		1.98	
	218.16 / 228.30			
Potts seam	22		1.07	
	229.97 / 249.89			
Collinsville Coal Measures – Lower – Little Bowen seam	33		0.38	
	250.27 / 251.36		0.18	
Bowen seam	36		5.06	
	254.59 / 259.64			
	295.83			
Blake seam	24		4.60	
	299.87			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc'	LN18759	CSIRO LR 338		11.0	7.9 (mmf)	81.1	
ws'	0.11			14.0	9.0	77.0	
ccc'	LN14002			28	26 (mmf)	39	7
ws'	2.26			30	28	42	
ccc'	LN18803			36	25 (mmf)	35	4
ws'	0.97			38	26	36	
ccc'	LN14003			40	25 (mmf)	22	13
ws'	1.49			46	29	25	
ccc'	LN14004			40	25 (mmf)	22	13
ls'	1.01			46	29	25	
ccc'	LN14007			45	26 (mmf)	19	10
	1.98			60	29	21	
ccc'	LN14171			10	14 (mmf)	52	24
	1.07			13	18	69	
B	LN14072			17	9 (mmf)	39	35
	0.38			26	14	60	
E	LN14075			42	5 (mmf)	4	49
	0.18			22	10	8	
ccc'	LN14140			21	18 (mmf)	44	17
ws'	5.06			25	22	53	
ccc'	LN14267			11	17 (mmf)	53	19
ws'	4.60			14	21	65	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
B	LN18759	CSIRO LR 338		1.80
	0.11			
ccc'	LN14002			1.35
ws'	2.26			
ccc'	LN18803			1.28
ws'	0.97			
ccc'	LN14003			1.60
ws'	1.49			
ccc'	LN14004			
ls'	1.01			1.34
ccc'	LN14007			1.33
	1.98			
ccc'	LN14171			1.46
	1.07			
B	LN14072			1.50
	0.38			
E	LN14075			1.46
	0.18			
ccc'	LN14140			1.36
ws'	5.06			
ccc'	LN14267			1.0
ws'	4.60			

PROXIMATE wt % ad

M	A	VM	FC
2.2	29.2 db / 29.9	11.5 daf / 16.7	57.1 / 83.3
1.0	12.0 db / 12.1	24.3 daf / 27.9	62.7 / 72.1
1.3	6.1 db / 6.2	25.5 daf / 27.8	67.1 / 72.2
1.6	23.0 db / 23.4	9.4 daf / 12.4	67.0 / 87.6
1.0	15.2 db / 15.4	24.1 daf / 28.8	59.7 / 71.2
1.1	18.1 db / 18.3	22.6 daf / 27.3	60.2 / 72.7
1.0	22.0 db / 22.2	18.5 daf / 24.1	58.5 / 75.9
0.8	28.3 db	18.9 daf / 26.1	52.0 / 73.9
0.9	32.9 db / 34.2	20.8 daf / 32.0	44.4 / 68.0
1.0	15.6 db / 15.8	19.1 daf / 32.9	64.3 / 77.1
1.0	17.5 db / 17.5	16.1 daf / 22.1	63.6 / 77.9

ULTIMATE wt % ad

C	H	O	N	S
75.6	4.2	2.6 daf	1.5	4.0
85.4	4.9	2.6	1.7	4.7
80.4	4.5	4.4 daf	1.7	0.6
67.5	2.0	2.- daf	1.2	3.6
88.4	2.6	2.8	1.5	4.7
72.7	4.2	4.8 daf	1.5	0.6
86.9	5.0	5.7	1.7	0.7
70.4	4.1	3.5 daf	1.4	3.4
85.0	5.0	4.3	1.6	4.1
66.5	3.7	4.0 daf	1.1	1.7
84.4	4.8	5.0	1.5	2.3
71.9	3.7	3.7 daf	1.6	0.8
88.0	4.5	4.6	2.0	0.9

SE MJ/kg	CSN
19.34 daf / 28.15	0
29.76 daf / 34.25	6
31.98 daf / 34.55	7½
25.14 daf / 32.94	
29.56 daf / 35.31	8
29.01 daf / 35.05	7½
26.80 daf / 34.82	1
24.05 daf / 33.41	2½
21.89 daf / 33.59	9½
29.68 daf / 35.57	3
28.89 daf / 35.38	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
1.30 daf / 1.08			0.008				
4.06 daf / 4.66	3.29 daf / 3.78	0.77 / 0.89	0.011		0.03	3	0.06
0.73	0.11 daf / 0.62		0.005		0.02	2	0.44
3.95 daf / 5.20	2.89 daf / 3.78	1.06 / 1.42	0.018		0.04	3	2.67
0.71 daf / 0.86	0.19 daf / 0.22	0.52 / 0.62	0.010		0.03		1.67
3.44 daf / 4.19	2.73 daf / 3.32	0.71 / 0.84	0.014		0.01	8	0.08
1.76 daf / 2.29	1.21 daf / 1.65	0.49 / 0.64	0.008		0.03	3	0.08
0.98 daf / 1.43			0.003				
6.36 daf / 9.12			0.001				
1.07 daf / 1.29	0.50 daf / 0.60	0.57 / 0.68	0.005		0.04	3	0.36
0.81 daf / 1.00	0.38 daf / 0.40	0.43 / 0.60	0.004		0.01	5	0.04

ASH

SiO_2 %	Al_2O_3 %
39.5	23.1
59.6	23.4
49.1	16.4
49.1	27.6
44.7	29.4
59.7	35.7
54.7	25.1
61.7	25.1
43.8	21.4

TRACE

B ppm ad	Ga ppm ad
<15	8
25	18
<3	6
5	6
8	25
7	4
6	1
8	3
2.5	2.8
6	3
4	3

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN ASHFORD BASIN
ASHFORD COAL MEASURES
LOCATION: Ashford
Ashford Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit %, mmf	Section	Thickness	Source	MACROSCOPIC	MICROLITHOTYPE - VOL % Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM	MACERAL - VOL % Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	V+E	I	MM	REFLECTANCE Sample type	Sample Number	Source	R_o max
Ashford C.M. — Ashford seam	60		9·25		TC	PN22762	CSIRO LR126	100	32	36	26	6	TCM	DS-1	JCB		57	38	5				
					WS	9·25			34	38	28						62	40					

CHEMICAL ANALYSES

STRATIGRAPHY	Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
Ashford C.M. — Ashford seam	TC	PN22215	CSIRO LR126	100		1·5	11·7	23·7	63·1	75·6	4·7	4·4	1·8	0·4	30·85		0·45	0·14	0·31	0·032		0·02		0·04	57·5	34·2	150	4
									daf			daf			daf													
	WS	9·25					11·9	27·3	72·7	87·1	5·4	5·1	2·1	0·5	35·54		0·52	0·16	0·36						1·7	1		

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN GUNNEDAH BASIN
MAULES CREEK FORMATION
LOCATION: DMR Howes Hill DDH 1

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit %, mmf	Section	Thickness	Source	MACROSCOPIC	MICROLITHOTYPE - VOL % Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM	MACERAL - VOL % Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	V+E	I	MM	REFLECTANCE Sample type	Sample Number	Source	R_o max
← Maules Ck Fm. No 13 seam	718·10 / 37			GSNSW	TC	LN85823 1·67 PN36643	IR1397R	9 / 14	10 / 19	37 / 67	44	TC	LN85823 1·67 PN36643	IR1397R		21 / 37	36 / 53	43	TC	LN85823 1·61		0·63

CHEMICAL ANALYSES

STRATIGRAPHY	Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
← Maules Ck Fm. No 13 seam	TC	LN85823 1·61	IR1397R			1·9	36·6	27·2	34·3								3·01	2·44	0·57	0·103					42·8	36·8	25	30
							db 37·3		daf 44·2								4·89	3·97	0·92						1·2	1		

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN GUNNEDAH BASIN
MAULES CREEK FORMATION
LOCATION: Boggabri
AMAX-BHP Bore ABB-029

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit %, mmf	Section	Thickness	Source	MACROSCOPIC	MICROLITHOTYPE - VOL % Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM	MACERAL - VOL % Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	V+E	I	MM	REFLECTANCE Sample type	Sample Number	Source	R_o max
Maules Creek Formation ↓ — No 3 seam	85·66 / 68		6·26		160F	C2645 6·26	CSIRO IR1394R	71·0	51 / 53	25 / 26	20 / 21	4	160F	C2645 6·26	CSIRO IR1394R	71·0	64 / 68	31 / 32	5	160F	C2645	AMAX-BHP	0·71
No 4 seam	116·06 / 82		1·59		160F	C2650 1·59		87·0	62 / 64	29 / 29	7 / 7	2	160F	C2650 1·59		87·0	79 / 82	18 / 18	3	160F	C2650 1·59		0·79
No 5 seam	154·95 / 63		3·02		160F	C2659 3·02		91·7	53 / 54	21 / 21	24 / 26	2	160F	C2659 3·02		91·7	61 / 63	37 / 37	2	160F	C2659		0·75
No 6 seam	185·65 / 68		3·50		160F	C2666 3·50		97·7	35 / 36	41 / 42	22 / 22	2	160F	C2666 3·50		97·7	57 / 58	41 / 42	2	160F	C2666		0·72
No 7 seam	186·92 / 86		0·81		160F	C2673 0·81		97·8	76 / 77	16 / 16	7 / 7	1	160F	C2673 0·81		97·8	85 / 86	14 / 14	1	160F	C2673		0·74
No 8 seam	189·67 / 81		1·72		160F	C2675 1·72		99·3	36 / 36	35 / 35	29 / 29	0	160F	C2675 1·72		99·3	51 / 51	49 / 49	tr	160F	C2675		0·74
No 10 seam	2·96 / 71		2·77		160F	C2696 2·77		95·8	54 / 56	27 / 27	17 / 17	2	160F	C2696 2·77		95·8	68 / 71	29 / 29	3	160F	C2696		0·76
No 11 seam	222·73 / 76		1·47		160F	C2702 1·47		98·2	62 / 63	22 / 22	15 / 15	1	160F	C2702 1·47		98·2	75 / 76	24 / 24	1	160F	C2702		0·78
No 12 seam	261·19 / 78		1·48		160F	C2704 1·48		99·2	64 / 65	25 / 25	10 / 10	1	160F	C2704 1·48		99·2	78 / 78	21 / 22	1	160F	C2704		0·80
No 13 seam	290·70 / 81		1·20		160F	C2709 1·20		98·8	76 / 78	15 / 15	7 / 7	2	160F	C2709 1·20		90·3	83 / 85	15 / 15	2	160F	C2709		0·77
No 14 seam	305·30 / 79		1·92		160F	C2797 1·92		88·4	63 / 64	26 / 26	10 / 10	1	160F	C2797 1·92		88·4	79 / 79	21 / 21	tr	160F	C2797		0·73
No 15 seam	323·10 / 85		1·63		160F	C2799 1·63		99·1	73 / 74	15 / 15	11 / 11	1	160F	C2799 1·63			85 / 85	15 / 15	tr	160F	C2799		0·77
No 16 seam	349·65 / 68		1·63																	160F	C2804		0·78
No 17 seam	355·38 / 68		0·99																	160F	C2826		0·83

CHEMICAL ANALYSES

STRATIGRAPHY	Sample type	Sample number, Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
Maules Creek Formation ↓ — No 3 seam	160F	C2645 6·26	CSIRO IR1394R	71·0	160	9·3	db 36·6	54·5	db 76·4	4·4								db 30·79	2	0·42								
							daf 40·1		daf 59·9									db 33·95		daf 0·46								
No 4 seam	160F	C2650 1·59		87·0	160	6·1	db 40·9	53·0	db 78·2	4·7								db 32·62	34	0·38								
							daf 43·6		daf 56·4									daf 34·74		daf 0·40								
No 5 seam	160F	C2659 3·02		91·7	160	5·2	db 35·3	58·5	db 78·8	4·2								db 32·28	24	0·29								
							daf 37·2		daf 62·8									daf 34·05		daf 0·31								
No 6 seam	160F	C2666 3·50		97·7	160	4·4	db 35·4	59·7	db 79·8	4·4								db 32·78	1	0·31								
							daf 37·6		daf 62·4									daf 34·29		daf 0·32								
No 7 seam	160F	C2673 0·81		97·8	160	4·0	db 41·2	54·8										33·49	4	0·36								
							daf 42·9											daf 34·90		daf 0·40								
No 8 seam	160F	C2675 1·72		99·3	160	4·1	db 34·4	61·5	db 80·6	4·3								db 32·94	2	0·32								
							daf 35·4		daf 64·1									daf 34·24		daf 0·33								
No 10 seam	160F	C2696 2·77		95·8	160	5·7	db 36·4	57·9	db 79·2	4·6								db 32·54	3	0·37								
							daf 38·6		daf 61·4									daf 34·51		daf 0·39								
Maules Creek Formation ↓ — No 11 seam	160F	C2702 1·47		98·2	160	4·3	db 38·1	57·6										db 33·09	34	0·39								
							daf 39·8											daf 34·58		daf 0·41								
No 12 seam	160F	C2704 1·48		99·2	160	3·5	db 36·9	57·8										db 33·51	42	0·35								
							daf 40·3											daf 34·73		daf 0·36								
No 13 seam	160F	C2709 1·20		90·8	160	6·2	db 40·5	53·3										db 32·09	5	0·35								
							daf 43·2											daf 34·85		daf 0·42								
No 14 seam	160F	C2797 1·92		88·4	160	5·0	db 39·2	55·8	db 80·5	4·8								db 33·09	6	0·40								
							daf 41·3		daf 84·5									daf 32·83		daf 0·42								
No 15 seam	160F	C2799 1·63		99·1	160	2·6	db 41·6	55·8	db 81·4	4·9								db 34·22	5	0·40								
							daf 42·7		daf 83·8									daf 33·15		daf 0·41								
No 16 seam	160F	C2804 1·63		98·4	160	5·1	db 40·3	54·6	79·4	4·8								db 33·42	52	0·38								
							daf 42·5		daf 84·2									daf 33·22		daf 0·40								
No 17 seam	160F	C2826		97·2	160	3·9	db 34·3	56·8										db 35·22	4	0·40								
							daf 40·1											daf 34·81		daf 0·42								

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN GUNNEDAH BASIN
MAULES CREEK FORMATION
LOCATION: Wingen
Wancol Blandford DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: Maules Creek Formation

Depth – Vit % mmf	Section	Thickness	Source
27.49			
31.47		3.98	
37.35		1.48	
38.83			
63.46		0.3	
64.59			
67.85		7.30	Wancol - BP Coalex
75.15			
95.95		1.20	
97.15			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	3022 – 3030	Wancol - BP Coalex - JCB	60	
ws	3.98			
1.46R	3027 – 3030			
ws	3.98			
ccc	3440 – 3441		79	
ws	1.48			
ccc	3420 – 3431			
ws	7.30			
ccc	3444 – 3445			
ws	1.20			

PROXIMATE wt % ad

M	A	VM	FC
5.9	14.0 db	32.7 daf	47.4
5.4	14.9 db 6.8 db 9.1	40.8 36.2 daf 42.9	59.2 51.6 daf 37.5
8.8	10.4 db 11.4	28.5 daf 35.2	52.3 61.8
8.6	6.1 db 6.7	29.9 daf 35.0	55.4 60.0
8.2	5.5 db 3.8	37.6 daf 36.9	55.7 63.1
8.5	6.7 db 7.5	31.9 daf 37.3	53.2 42.7

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
25.10 daf	6
31.33	7
28.75 daf	2
31.99	2
25.63 daf	0
31.72	0
27.07 daf	0
31.74	0
28.28 daf	0
32.03	0
26.82 daf	0
31.63	0

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.60 daf 0.80							
0.30 daf 0.32							
0.38 daf 0.65							
0.52 daf 0.98							
0.55 daf 0.85							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN GUNNEDAH BASIN
MAULES CREEK FORMATION
LOCATION: DM Breeza DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: Maules Creek Formation

Depth – Vit % mmf	Section	Thickness	Source
444.84			
No11 seam		1.14	GSNSW GS1976/219
447.78		0.10	
449.62		1.11	
No12 seam			
451.45			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
1.45R	GS1976/219 – 907-24	GSNSW GS1976/219	97	1.37
ws	1.77			
rc	GS1976/219 – 907-24		96	1.38
ws	1.77			
1.45R	GS1976/219 – 833-38		38	1.37
ls	0.10			
rc	GS1976/219 – 833-38		90	1.39
ls	0.10			
1.46R	GS1976/219 – 907-24		41	1.44
ws	1.77			
rc	GS1976/219 – 907-24			1.61
ws	1.77			

PROXIMATE wt % ad

M	A	VM	FC
2.1	10.3 db 10.5 db 10.6 db 11.0 db 16.0 db 14.4 db 18.4 db 17.5	33.5 daf 33.9 daf 33.3 daf 34.2 daf 37.8 daf 29.0 daf 35.6 daf 43.0	54.3 42.0 33.8 61.8 44.1 55.2 55.7 43.5 55.0
2.1		40.3 daf 41.2	28.1 44.8

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
30.00 daf 34.25	3
28.65 daf 34.05	6
29.50 daf 36.05	3

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.36 daf 0.40							
0.73							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN GUNNEDAH BASIN
MAULES CREEK FORMATION
LOCATION: DM Emerald Hill DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: ← Maules Creek Fm →

Depth – Vit % mmf	Section	Thickness	Source
176.35			
No1 seam		0.44	GSNSW GS1976/219
176.79			
181.17			
191.24			
195.30		0.34	
195.64			
239.04			
No2 seam		0.56	
239.70			
240.33			
No3 seam		0.68	
241.01			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
1.45R	GS1975/1918-24	GSNSW GS1976/219	69	1.59
ws	0.98			
ccc	GS1975/1918-24		93	1.53
ws	0.98			
1.45R	GS1975/1925-27		8	1.45
ws	0.48			
rc	GS1976/1925-27		94	1.49
ws	0.98			

PROXIMATE wt % ad

M	A	VM	FC
2.1	11.7 db	35.9 daf	50.4
2.2	11.8 17.5 db 11.9	41.5 30.0 daf 41.8	54.5 41.7 58.2
1.9	18.5 db 18.9	29.9 daf 36.3	50.7 63.7
1.4	6.6 db 6.24	16.9 daf 44.1	20.5 55.3

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
29.40 daf 34.10	12
27.50 daf 34.60	1
	0

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
2.09 daf 2.41							
0.46 daf 1.24							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN CRANKY CORNER BASIN
GRETA COAL MEASURES
LOCATION: Glendonbrook
Great Greta Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	MACROSCOPIC	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM	MICROLITHOTYPE - VOL %	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	MACERAL - VOL %	Sample type	Sample Number	Source	R_o max	REFLECTANCE
Greta Coal Measures	71		5.67	CSIRO LR104		ccc us	LN851 PN1038 5.67			50 61	30 18 2 mmf 31 18				ccc us	LN851 PN1038 5.67		100	68 2.7 5 mmf 72 28							

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc us	LN851 5.67	CSIRO LR104	100	1.35	1.4	11.1 db 11.3	46.8 daf 52.8	40.7 daf 47.2	69.4 79.4	5.3 6.1	7.0 daf 7.8	1.1 1.3	4.7 5.4	29.85 daf 34.13	3.5	0.26 0.01	0.43 daf 0.49	4.83 5.52	0.042		0.01	6	1.26	25.0 0.8	24.5 1.1	150	3

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Maitland
Planet Oil (East Maitland) No 1

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	MACROSCOPIC	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM	MICROLITHOTYPE - VOL %	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	MACERAL - VOL %	Sample type	Sample Number	Source	R_o max	REFLECTANCE
Greta C.M. (cuttings)	412.75 73 417.02		4.27	CSIRO LR50		tcc ts	LN17852 4.27	CSIRO LR50	68.3	41 53	31 mmf 39	7 7	21										tcc ts	LN17852		1.40	

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
tcc ts	LN17852 4.27	CSIRO LR50	68.3		5.0	9.4 db 9.7	21.8 daf 24.4	65.6 daf 75.1	77.2 88.2	4.2 4.8	3.4 daf 3.8	1.7 1.9	1.1 1.3		8.4	1.12 1.28	0.45 daf 0.51	0.67 0.76									

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Balmoral
Balmoral Bores DDH D21 , S8 , S9 , S10 and S11

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	MACROSCOPIC	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM	MICROLITHOTYPE - VOL %	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	MACERAL - VOL %	Sample type	Sample Number	Source	R_o max	REFLECTANCE
Hilltop seam	77.72 78.89 92.07 92.66 96.45 98.26 98.93		1.17	CSIRO LR142																							
Upper Brougham seam	70 15.65 16.64		2.13	CSIRO LR349		ccc us	LN21736 2.13	CSIRO LR349	>80	45 46	38 mmf 39	14 15	3		ccc us	LN21736 2.13		>80	67 70	28 mmf 30	5					
Lower Brougham seam	71 16.62		1.98	CSIRO LR349		ccc ls	LN21737 1.98	CSIRO LR349	>80	41 43	38 mmf 40	16 17	5		ccc ls	LN21737 1.98		>80	65 71	27 mmf 29	8					
Upper Grasstrees seam	65 15.17 17.11		1.94	CSIRO LR352		ccc us	LN21853 1.94	CSIRO LR352	>90	36 37	32 mmf 33	30 30	2		ccc us	LN21853 1.94		>90	60 65	31 mmf 35	9					
Lower Grasstrees seam	78 19.11 20.51		1.40	CSIRO LR352		ccc ls	LN21854 1.40	CSIRO LR352	>90	42 42	44 mmf 45	13 13	1		ccc ls	LN21854 1.40		>90	75 78	21 mmf 22	4					
Theiss seam	77 11.03 12.79		1.76	CSIRO LR351		ccc ms	LN21769 1.76	CSIRO LR351	93	49 51	41 mmf 42	7 7	3		ccc ls	LN21769 1.76		93	73 77	22 mmf 23	5					
Puxtrees seam	64 20.70 24.09		3.39	CSIRO LR345		ccc ws	LN21811 3.39	CSIRO LR345	90	30 31	50 mmf 51	18 18	2		ccc ws	LN21811 3.39		90	60 64	34 mmf 36	6					
Balmoral seam	56 13.04 25.12		12.08	CSIRO LR345		ccc ws	LN21261 12.08	CSIRO LR345	90	31 32	43 mmf 45	22 23	4		ccc ws	LN21261 12.08		90	50 56	39 mmf 44	11					

Greta Coal Measures

CSIRO data

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
tcc us	LN2566 1.17	CSIRO LR142	60	1.43	2.3	16.7 db 17.1	42.7 daf 51.1	38.3 daf 48.3	62.7 77.3	5.0 6.2	5.6 daf 7.0	1.4 1.7	6.3 7.8	27.40 daf 33.80	4	0.45 0.51	daf		0.011		0.01		1.66				
ccc us	LN21736 2.13	CSIRO LR349	>80	45 46	38 mmf 39	14 15	3	ccc us	LN21736 2.13	>80	67 70	28 mmf 30	5	ccc us	LN21736 2.13	>80	3.7	7.0 db 7.5	38.0 daf 42.5	51.3 daf 57.5	14.1 83.0	5.1 5.7	7.7 daf 8.5	1.7 2.0	0.7 0.8	30.89 daf 34.59	4.2	0.82 0.92	0.14 daf 0.16	0.68 0.76	0.08		0.06	4.1	0.06	6.2 2.3	27.1 1	20	3
ccc ls	LN21737 1.98	CSIRO LR349	>80	41 43	38 mmf 40	16 17	5	ccc ls	LN21737 1.98	>80	65 71	27 mmf 29	8	ccc ls	LN21737 1.98	>80	3.7	8.6 db 8.9	37.5 daf 42.7	50.2 daf 57.3	72.8 83.0	5.0 5.7	7.6 daf 8.7	1.7 1.9	0.6 0.7	30.24 daf 34.45	3.1	0.78 0.89	0.19 daf 0.22	0.69 0.67	0.13		0.06	<1	0.78	50.9 29.0	17.6 1	25	2
ccc us	LN21853 1.94	CSIRO LR352	>90	36 37	32 mmf 33	30 30	2	ccc us	LN21853 1.94	>90	60 65	31 mmf 35	9	ccc us	LN21853 1.94	>90	2.5	8.0 db 8.2	37.1 daf 41.5	52.4 daf 58.5	74.3 85.0	5.1 5.7	7.7 daf 8.6	1.7 1.9	0.7 0.8	31.10 daf 34.75	3.1	1.20 1.34	0.52 daf 0.58	0.68 0.76	0.06		0.06	9	0.06	62.1 2.8	22.3 1	50	2
ccc ls	LN21854 1.40	CSIRO LR352	>90	42 42	44 mmf 45	13 13	1	ccc ls	LN21854 1.40	>90	75 78	21 mmf 22	4	ccc ls	LN21854 1.40	>90	2.4	6.5 db 6.7	40.3 daf 44.2	50.8 daf 55.8	75.6 82.9	5.3 5.8	7.9 daf 8.7	1.7 1.9	0.7 0.7	31.61 daf 34.71	5.4	0.80 0.88	0.14 daf 0.15	0.66 0.72	0.008		0.02	<1	0.13	72.3 4.0	18.1 1	60	25
ccc ms	LN21769 1.76	CSIRO LR351	93	49 51	41 mmf 42	7 7	3	ccc ls	LN21769 1.76	93	73 77	22 mmf 23	5	ccc ms	LN21769 1.76	93	3.2	6.2 db 6.4	38.5 daf 42.5	52.1 daf 57.5	74.6 82.3	5.2 5.7	8.3 daf 9.2	1.7 1.9	0.8 0.9	31.15 daf 34.34	1.2	0.79 0.87	0.00 daf 0.00	0.79 0.87	0.009		0.09	16	0.62	52.9 2.3	22.8 1	90	15
ccc ws	LN21811 3.39	CSIRO LR345	90	30 31	50 mmf 51	18 18	2	ccc ws	LN21811 3.39	90	60 64	34 mmf 36	6	ccc ws	LN21811 3.39	90	3.7	6.9 db 7.2	36.2 daf 40.5	53.2 daf 59.5	74.4 85.3	5.0 5.6	7.6 daf 8.5	1.7 1.9	0.7 0.7	30.85 daf 34.55	2	0.76 0.85	0.09 daf 0.10	0.67 0.75	0.008		0.06	53	0.24	68.5 3.3	20.7 1	30	15
ccc ws	LN21251 12.08	CSIRO LR345	90	31 32	43 mmf 45	22 23	4	ccc ws	LN21261 12.08	90	50 56	39 mmf 44	11	ccc ws	LN21251 12.08	90	3.5	8.3 db 8.6	34.5 daf 39.1	53.7 daf 60.9	73.1 82.9	4.8 5.4	8.1 daf 9.1	1.6 1.9	0.6 0.7	30.08 daf 34.08	1	0.83 0.94	0.25 daf 0.28	0.58 0.65	0.12		0.05	13	0.30	47.9 1.5	32.4 1	50	3

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Cessnock
Pelton Colliery Aberdare Extended

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+Cl+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Greta C.M. Greta seam	167.00			CSIRO LR282	ccc	LN10765	CSIRO LR282	100	69	20 mmf	7	4	ccc	PN7242	CSIRO LR280	100	75 mmf	19	6				
	83		3.63		ws	3.63			72	21	7		ws	7.79			80 mmf	20					
	170.63																					

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc	LN10765	CSIRO LR282	100	1.28	2.4	6.1 db	41.0 daf	50.5 daf	76.0	5.6	7.2 daf	1.9	0.8	31.96 daf	4½	0.88	0.22 daf	0.66	0.058		0.00	4	0.23	44.7	31.2	100	1
ws	3.63					0.5	44.8	55.2	83.0	6.1	8.0	2.0	0.9	34.94		0.86	0.24	0.72						1.59	:1		

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Branxton
Ayrfield No 3 Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+Cl+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Greta C.M. Greta seam Lower Section	185.00			CSIRO LR285	ccc	LN11434	CSIRO LR285	100	53	35 mmf	12	-											
	71		2.59		ls	2.59			53	35 mmf	12	-											
	187.54																					

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc	LN11434	CSIRO LR285	100	1.30	2.4	6.2 db	38.9 daf	52.5 daf	76.1	5.3	7.4 daf	1.8	0.8	31.85 daf	5	0.40	0.18 daf	0.72	0.026		0.00	4	1.01	38.8	28.4	350	1
ls	2.59					4.4	42.6	53.0	83.3	5.8	8.0	2.0	0.9	34.85		0.98	0.20	0.78						1.4	:1		

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Muswellbrook
Muswellbrook No 1 Opencut

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+Cl+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Greta Coal Measures																						
Fleming seam			10.00	CSIRO LR120																		
Hallett seam			1.04		ccc	LN2005	LR120	100	1.35	1.6	0.1 db	26.2 daf	63.1 daf	78.0	4.8	3.7 daf	1.8	1.0	32.01 daf	1	1.07	0.34 daf	0.73	0.056		0.00	1	0.12	61.3	25.7		
					ws	1.01					9.2	29.2	70.8	87.5	5.3	4.2	2.0	1.2	35.85		1.20	0.38	0.82						2.4	:1		
Muswellbrook seam			4.78	LR125	ccc	LN2014		100	1.30	2.6	6.0 db	37.4 daf	54.0 daf	76.2	5.2	7.6 daf	1.6	0.8	31.78 daf	3½	0.84	0.16 daf	0.68	0.04		0.02	2	0.16	54.4	31.8		
					ws	4.78					6.2	40.8	59.2	83.4	5.7	8.2	1.8	0.9	34.78		0.92	0.18	0.74						1.7	:1		
St. Helliers seam			3.94	CSIRO LR122	ccc	LN2030	LR122	100	1.31	2.5	5.2 db	34.1 daf	53.2 daf	76.2	5.2	8.5 daf	1.6	0.8	31.73 daf	3	0.84	0.18 daf	0.66	0.035		0.01	3	0.42	44.4	24.5		
					ws	8.84					5.3	42.0	58.0	82.6	5.6	9.2	1.7	0.9	34.38		0.91	0.20	0.72						1.8	:1		
					com	DS-4	JCB				3.4	7.1 db	34.1 daf	63.2 daf	77.9	4.6	8.5 daf	1.6	0.3		1	0.84	0.26 daf	0.58	0.009		0.01		0.2	56.8	33.3		
Lewis seam	48		20.00								13	37.4	62.4	83.9	5.0	4.1	1.7	0.3			0.90	0.28	0.62						1.7	:1		
					com	DS-4					46 mmf 48	4.9 152	5																			

JCB/2.2.1976

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Muswellbrook
Muswellbrook Coal Co. Development DDH 2

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Muswellbrook
Muswellbrook Coal Co. Development DDH 2

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth in Vit % mmf	Section	Thickness	Source
Greta Coal Measures	63·91			
No1 seam	59		1·03	
	64·94			
	79·28			
No2. seam	79		4·88	
	84·17			
	85·64			
No3. seam	62		9·63	J.C.B.
	95·27			
	99·68			
No4 seam	49		2·96	
	102·64			
	104·25			
No5 seam	32		5·01	
	109·26			
	110·25			
No6 seam			2·85	
	119·18			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
160F	PN33477	CSIRO IR 1423R	92	47	25 (mmf 25)	26	2
WS'	1·03			48	25	27	
160F	PN33478		92	58	26 (mmf 26)	26	2
WS'	4·88			60	26	26	
160F	PN33479		92	43	34 (mmf 35)	21	2
WS'	9·63			44	35	21	
160F	PN33480		88	28	33 (mmf 34)	36	3
WS'	2·96			29	34	37	
160F	PN33481		95	7	40 (mmf 40)	52	1
WS'	5·01			7	40	53	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
160F	PN33477	CSIRO IR 1423R		58	40	2
WS'	1·03			59	41	
160F	PN33478		92	77 (mmf 79)	21	2
WS'	4·88			79	21	
160F	PN33479		92	61 (mmf 62)	37 (mmf 38)	2
WS'	9·63			62	38	
160F	PN33480		88	48	49 (mmf 51)	3
WS'	2·96			49	51	
160F	PN33481		95	31	66 (mmf 68)	3
WS'	5·01			32	68	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
160F	PN33477	CSIRO	0·61

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
WS'	2·38	CSIRO IR 1423R	62	1·47	2·5	29·3	30·8	34·9						22·58	4	0·41											
						db	daf	daf						daf		daf											
TC'	1·03					3·4	32·1	43·5	56·4					31·44		0·98											
160F	2·38		65				8·1	37·0	54·9					31·50	1	0·35		0·030									
							db	daf	daf					daf		daf											
WS'	1·03						9·4	40·3	59·7					34·06		0·60											
TC'	2·39		94	1·30	2·9	9·8	40·4	49·6						30·68	3½	0·64											
						db	daf	daf						daf		daf											
WS'	4·88						10·1	44·8	55·2					34·00		0·71											
160F	2·39		92		2·6	6·7	41·1	52·2						32·02	4½	0·68		0·049									
						db	daf	daf						daf		daf											
WS'	4·88						8·9	44·1	55·9					34·32		0·73											
YC'	2·40 – 2·42		92	1·31	3·0	11·1	37·5	51·5						30·36	2½	0·87											
						db	daf	daf						daf		daf											
WS'	9·63						11·4	42·1	57·9					34·10		0·98											
160F	2·40 – 2·42		92		2·9	6·3	39·0	54·7						32·14	2	0·85		0·032									
						db	daf	daf						daf		daf											
WS'	9·63						9·5	41·6	58·4					34·30		0·91											
TC'	2·43	JC.B	92	1·35	2·9	15·2	34·4	50·4						28·24	1	0·35											
						db	daf	daf						daf		daf											
WS'	2·96						15·7	40·6	59·4					33·30		1·00											
160F	2·43		88		3·8	8·7	33·9	53·4						30·98	1	0·78		0·006									
						db	daf	daf						daf		daf											
WS'	2·96						9·0	37·1	62·9					33·50		0·85											
TC'	2·44		100	1·30	3·2	11·0	30·6	58·4						29·94	½	0·61											
						db	daf	daf						daf		daf											
WS'	5·01						11·4	31·4	65·6					33·64		0·89											
160F	2·44		95		4·6	8·6	30·5	60·9						30·72	½	0·68		0·019									
						db	daf	daf						daf		daf											
WS'	5·01						9·0	33·4	66·6					33·60		0·74											

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Singleton
AOG Loder Dome No 1

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Singleton
AOG Loder Dome No 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth in Vit % mmf	Section	Thickness	Source
Greta Coal Measures (cuttings)	704·00			
	65		1·33	
	705·62			
	725·43		1·52	CSIRO IR50
	80			
	726·95			
	746·76		3·05	
	62			
	749·81			
	752·86		3·05	
	54			
	755·91			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
160F	LN17794	CSIRO IR50	90·1	34	52 (mmf 56)	6	8
	1·33			37	56	6	
160F	LN17795		52·5	36	21 (mmf 36)	1	42
	1·52			62	36	2	
160F	LN17796 + 17797			20	38 (mmf 39)	6	21
	3·05			31	59	9	
160F	LN17798 + 17799			19	44 (mmf 58)	13	18
	3·05			25	58	17	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
160F	LN17794	CSIRO IR50	0·90
160F	LN17795		0·88
160F	LN17796		1·01
160F	LN17797		0·99
160F	LN17798		1·00
160F	LN17799		1·05

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
160F	LN17794		90·1		2·1	6·1	34·7	57·1	78·3	5·0	13·3	1·4	3·8		9	3·60	0·86	2·94									
	1·63					db	daf	daf						daf		daf	daf										
						6·2	37·8	62·2	85·3	5·5	5·6	1·5	4·1			4·19	0·99	3·20									
160F	LN17795		52·5		2·1	8·8	33·7	55·4	76·9	5·0	13·4	1·3	3·5		9	3·41	1·45	2·06									
	1·52					db	daf	daf						daf		daf	daf										
						9·0	37·4	62·1	85·2	5·6	3·8	1·5	3·9			3·92	1·60	2·31									
160F	LN17796 + 17797		63·7		2·2	13·5	28·8	55·5	72·4	4·6	14·7	1·6	1·0		7	1·05	0·24	0·81									
	3·05					db	daf	daf						daf		daf	daf										
						13·8	34·2	65·8	85·9	5·5	5·6	1·9	1·2			1·25	0·28	0·96									
160F	LN17798 + 17799		68·9		2·2	11·2	27·6	59·0	75·2	4·6	16·6	1·6	0·7		8	0·75	0·15	0·69									
	3·05					db	daf	daf						daf		daf	daf										
						11·5	31·9	68·1	86·8	5·3	5·3	1·8	0·8			0·87	0·17	0·80									

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Kurri Kurri
Hebburn No 2, Stanford Main No 1

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Kurri Kurri
Hebburn No 2, Stanford Main No 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Greta Coal Measures				
Main Greta Upper seam	81		2·72	LR87
Main Greta Lower seam	76		2·05	LR117
Homeville Upper seam	79		3·71	LR132
Homeville Lower seam	74		1·79	CSIRO LR136

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc	LN521	CSIRO data	100	68	23	8	1
ws	2·72			69	23	8	
ccc	LN1989		100	57	32	8	3
ws	2·05			59	33	8	
ws	PN985		100	62	31	7	0
	3·71			62	31	7	
ccc	PN963		100	52	41	7	0
ws	1·79			52	41	7	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ws	PN985	CSIRO data	100	77 / 79	21 / 21	2
	3·71					
ccc	PN963		100	72 / 74	25 / 26	3
ws	1·79					

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ccc	LN521	LR87	100	1·35	1·6	7·8 db	43·7 daf	46·9 daf	73·0	5·5	7·0 daf	1·7	3·4	31·47 daf	4	3·51	2·07 daf	1·44	0·100		0·01	2	0·44	21·6	22·9		
ws	2·72					7·9	48·0	52·0	80·5	6·1	7·8	1·9	3·7	34·73		3·81	2·29	1·59						0·9	1·1		
ccc	LN1989	LR117	100	1·27	2·0	5·9 db	40·7 daf	51·4 daf	77·1	5·7	6·6 daf	2·0	0·7	32·27 daf	3	0·83	0·13 daf	0·70	<0·04		0·01	4	0·22	47·2	30·1	200	1·5
ws	2·05					6·0	44·1	55·9	83·6	6·2	7·1	2·1	0·8	35·06		0·90	0·14	0·76						1·6	1·1		
ws	LN2054	LR132	100	1·27	2·2	4·6 db	41·9 daf	51·5 daf	78·3	5·6	6·8 daf	1·8	0·7	32·82 daf	4½	0·79	0·17 daf	0·62	<0·20		tr	1	0·17	40·8	31·8	200	1·5
	3·71					4·7	44·9	55·1	84·0	6·0	7·3	1·9	0·8	35·22		0·85	0·18	0·67						1·3	1·1		
ccc	LN2060	LR136	100	1·24	2·6	6·4 db	40·1 daf	50·9 daf	76·9	5·4	7·2 daf	1·7	0·8	32·01 daf	4	0·85	0·10 daf	0·75	<0·07		0·05	1	0·06	49·6	35·9	150	2·5
ws	1·79					6·6	43·9	56·1	83·3	5·9	8·0	1·9	0·9	35·15		0·93	0·11	0·82						1·4	1·1		

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Balmoral
Balmoral Bore DDHA 2

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
GRETA COAL MEASURES
LOCATION: Balmoral
Balmoral Bore DDHA 2

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Greta Coal Measures				
Upper Brougham seam	7·62		1·80	LR155
Lower Brougham seam	9·42 – 11·96		1·83	
	15·79 – 16·86			
	18·01 – 20·60			
	20·64			
Upper Grasstrees seam	28·12 – 28·81		69	
Lower Grasstrees seam	34·92 – 36·01		1·09	LR158
Unnamed	35·61 – 36·02 – 38·99		941	
Theiss seam	39·19 – 40·31 – 42·22 – 76·18		1·91	
Savoy – Balmoral seam	90·41		7·24	CSIRO LR155

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
rc	LN2807	LR155	100	1·49	12·9	8·6 db	32·7 daf
ws	1·80				9·9	41·6	58·4
rc	LN2808		100	1·32	5·1	6·1 db	36·5 daf
ws	1·83				6·4	40·0	60·0
rc	LN2809		100	1·34	3·1	10·7 db	37·6 daf
ws	0·69				11·0	43·6	56·4
rc	LN2844	LR158	100	1·28	2·9	5·7 db	39·4 daf
ws	1·03				5·9	43·0	57·0
rc	LN2812		100	1·35	3·4	8·9 db	36·3 daf
ws	0·41				9·2	43·7	56·3
rc	LN2813		100	1·28	3·1	6·3 db	34·0 daf
ws	1·91				6·5	43·0	57·0
ccc	LN2815	CSIRO LR155	100	1·34	3·0	13·1 db	33·2 daf
ws	0·51				13·5	39·4	60·4
rc	LN2017		100	1·26	2·9	7·0 db	35·9 daf
ws	0·84				9·2	39·8	60·2
ccc	LN2819		100	2·21	3·1	7·7 db	35·0 daf
ls	7·24				7·9	38·8	61·2

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ccc		Cook and Read (data)	100	59 / 65	32 / 35	9
ws	1·73					

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
rc	LN2807	LR155	100	1·49	12·9	8·6 db	32·7 daf	45·8 daf						33·56 daf	1	0·44											
ws	1·80				9·9	41·6	58·4							24·91		0·58											
rc	LN2808		100	1·32	5·1	6·1 db	36·5 daf	55·3 daf	70·4	4·6	11·3 daf	1·8	0·7	28·81 daf	1	0·72			0·069				0·16				
ws	1·83					6·9	40·0	60·0	79·3	5·2	12·7	2·0	0·8	31·52		0·81											
rc	LN2809		100	1·34	3·1	10·7 db	37·6 daf	48·6 daf						29·64 daf	1	0·86 daf											
ws	0·69					11·0	43·6	56·4						34·56		1·0											
rc	LN2844		100	1·28	2·9	5·7 db	39·4 daf	52·0 daf	76·1	5·3	7·6 daf	1·6	0·8	31·68 daf		0·79 daf			0·006				0·17				
ws	1·03					5·9	43·0	57·0	83·2	5·8	8·3	1·8	0·9	34·66		0·86											
rc	LN2812		100	1·35	3·4	8·9 db	36·3 daf	49·4 daf						29·94 daf	3	1·96 daf											
ws	0·41					9·2	43·7	56·3						34·15		2·23											
rc	LN2813		100	1·28	3·1	6·3 db	34·0 daf	51·6 daf	74·7	5·2	8·1 daf	1·7	0·9	31·13 daf	3½	0·96 daf			0·004				0·25				
ws	1·91					6·5	43·0	57·0	82·5	5·7	9·1	1·8	1·0	34·36		1·04											
ccc	LN2815		100	1·34	3·0	13·1 db	33·2 daf	50·7 daf						28·45 daf	1	0·72 daf											
ws	0·51					13·5	39·4	60·4						33·92		0·96											
rc	LN2017		100	1·26	2·9	7·0 db	35·9 daf	54·2 daf						30·52 daf		0·72 daf											
ws	0·84					9·2	39·8	60·2						33·87		0·80											
ccc	LN2819		100	2·21	3·1	7·7 db	35·0 daf	54·2 daf	74·3	4·8	7·8 daf	1·6	0·7	30·36 daf		0·873 daf	0·28	0·60	0·13		0·09	12	0·09	47·0	35·5		
ls	7·24					7·9	38·8	61·2	83·2	5·4	8·8	1·8	0·8	34·03		1·0	0·31	0·67						1·4	1·1		

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
CLYDE COAL MEASURES
LOCATION: Clyde River

PERMIAN COALS OF EASTERN AUSTRALIA
EARLY PERMIAN SYDNEY BASIN
CLYDE COAL MEASURES
LOCATION: Clyde River

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Clyde C.M.				
Unnamed seam	65			Cook and Read (data)

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc		Cook and Read (data)	100	22	60	11	7
ws	1·73			24	64	12	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ccc		Cook and Read (data)	100	59 / 65	32 / 35	9
ws	1·73					

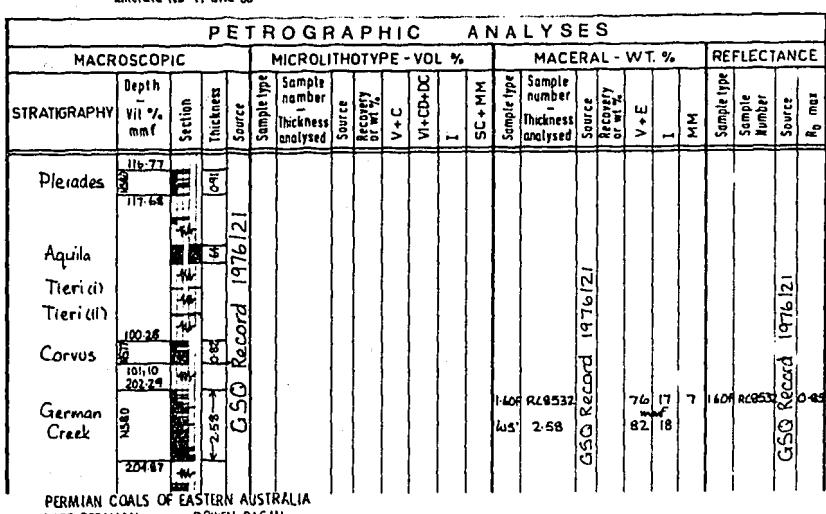
REFLECTANCE

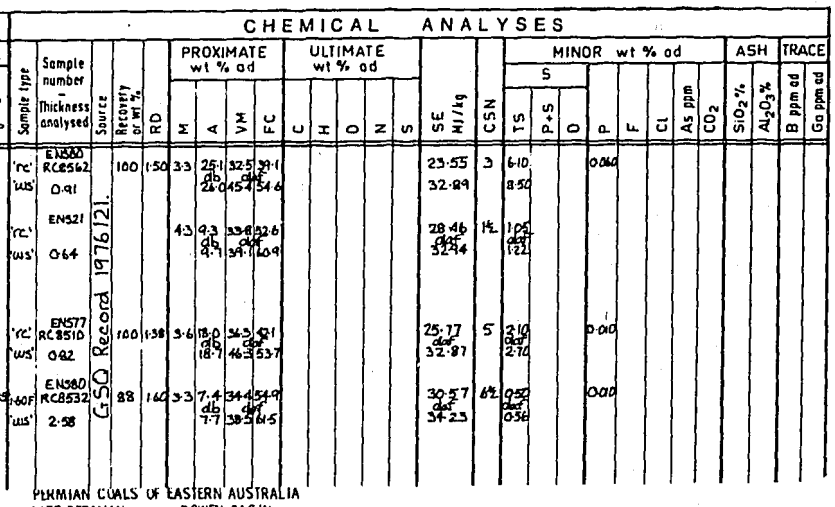
Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

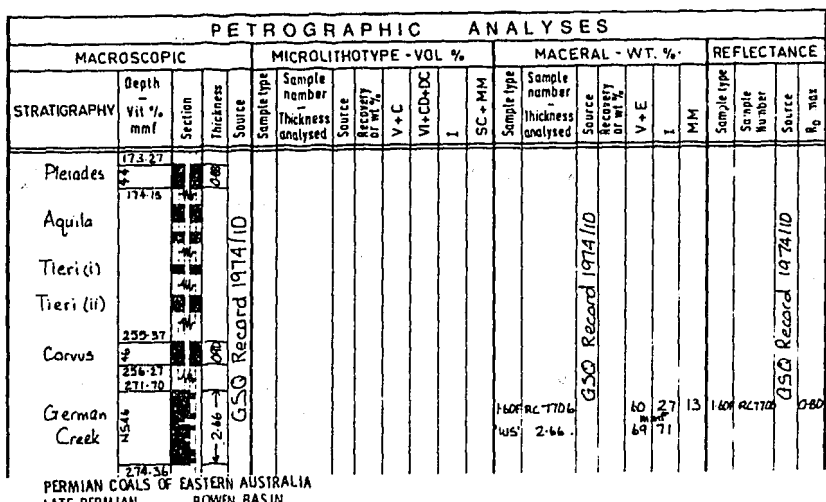
Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws	1·73	Cook and Read (data)				16·5 db	29·5 daf	54·0 daf								1·02 daf											
							35·3	64·7								1·22											

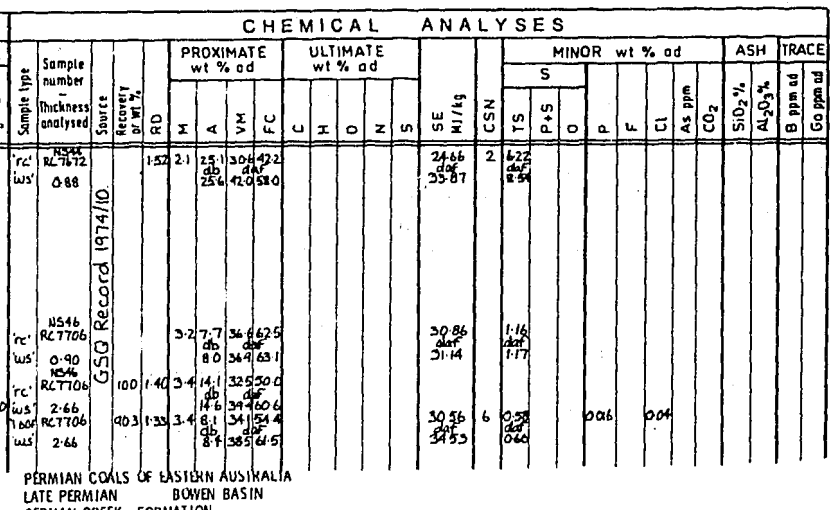
PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Emerald
Emerald NS 77 and 80



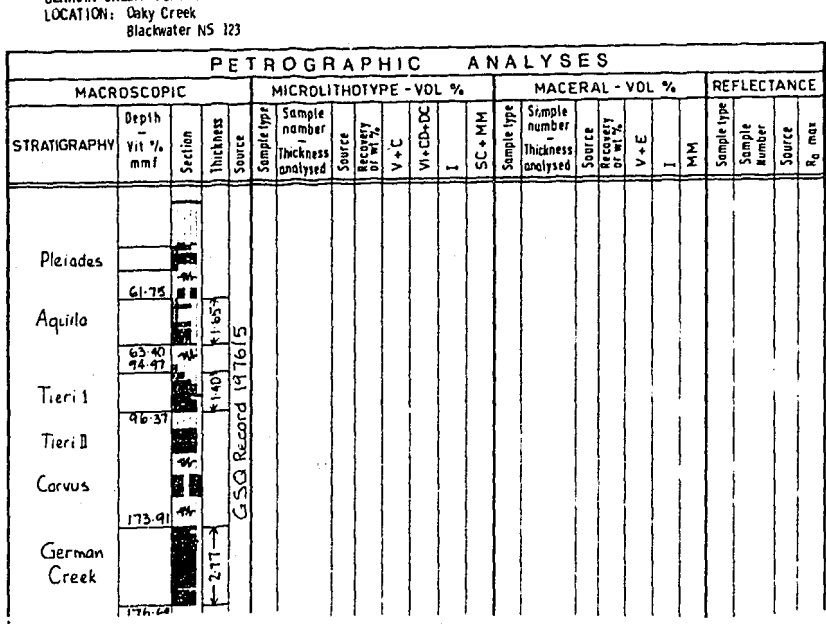


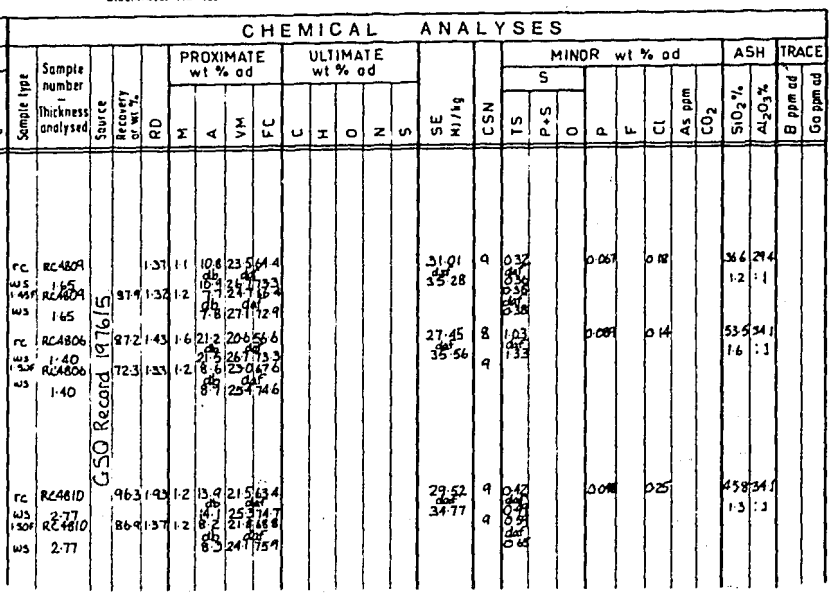
PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Emerald
Emerald NS 44 and 46



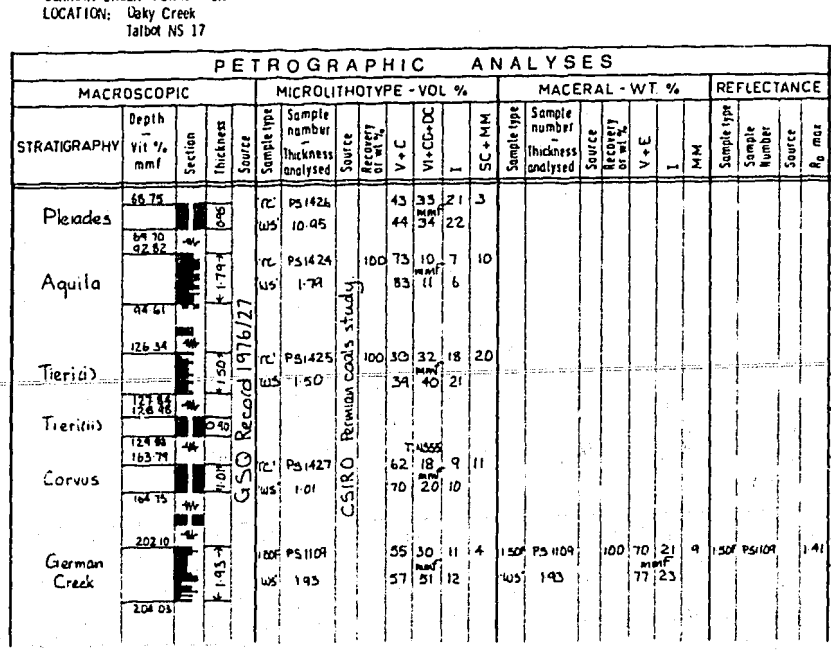


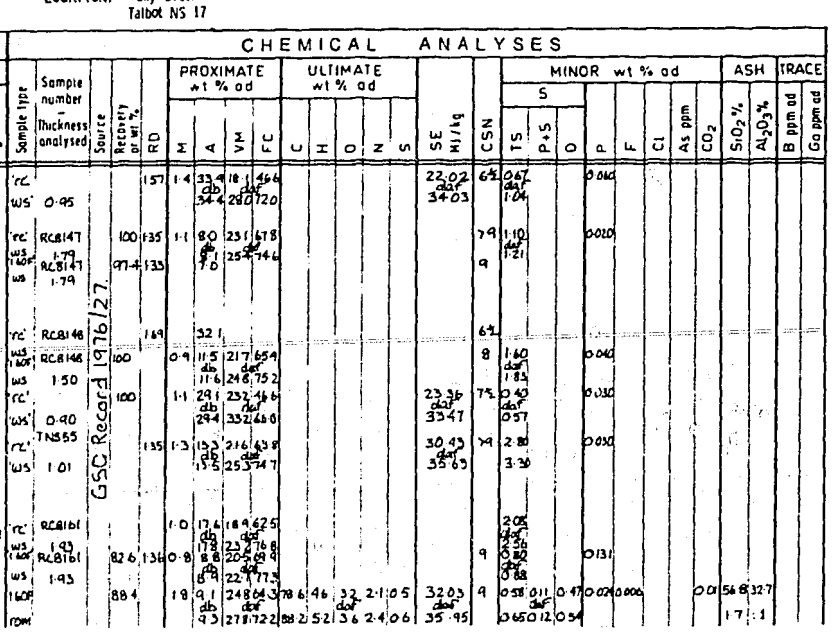
PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Oaky Creek
Blackwater NS 123





PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Oaky Creek
Talbot NS 17





PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Emerald
Talbot NS 74

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Pleiades	171.22		1.02	GSQ Record 1976/21
	172.24			
Aquila				
Tieri(i)				
Tieri(ii)				
Corvus	254.56		0.88	
	255.44			
	275.07			
German Creek			2.82	
	277.89			

MACROSCOPIC — MICROLITHOTYPE - VOL % — MACERAL - WT % — REFLECTANCE

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vit+CD+DC	I	SC+MM
'rc'	RC8529	GSQ Record 1976/21	100	1-41	2·3	24·0	29·0 44·7
'ws'	1·02					24·6	34·3 60·7
'rc'	RC8534		100	1·36	1·8	13·9	32·0 52·3
'ws'	0·88					14·2	38·0 62·0
150F	RC 8513		72·4	1·50	2·1	10·4	30·5 57·0
'ws'	2·82					10·6	34·1 65·1

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM
150F	RC 8513	GSQ Record 1976/21		76	14	10
'ws'	2·82			84	16	

Sample type	Sample Number	Source	R_o max
150F	RC8513	GSQ Record 1976/21	1·01
'ws'			

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'rc'	RC8529	GSQ Record 1976/21	100	1·41	2·3	24·0	29·0	44·7						25·70	3½	2·8			0·03								
						db								daf		daf											
'ws'	1·02					24·6	34·3	60·7						34·87		3·8											
'rc'	RC8534		100	1·36	1·8	13·9	32·0	52·3						29·38	7½	2·5			0·02								
						db								daf													
'ws'	0·88					14·2	38·0	62·0						34·85		3·0											
150F	RC 8513		72·4	1·50	2·1	10·4	30·5	57·0							8½	0·54			0·045								
						db										daf											
'ws'	2·82					10·6	34·1	65·1								0·62											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Emerald
Emerald NS 31 , 5R and 6

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Pleiades	195·05		0·65	GSQ Records 1973/28 and 1974/6
	195·70			
Aquila	207·77		0·81	
	208·58			
Corvus(i)	227·64		0·66	
	228·30			
	233·47			
Corvus(ii)			2·70	
	235·47			
	260·01			
German Creek			1·25	
	261·26			
	263·04			
	270·42			
	272·51			
Cetus			1·04	
	273·55			
	276·06			
Cygnus			1·15	
	357·23			

MACROSCOPIC — MICROLITHOTYPE - VOL % — MACERAL - VOL % — REFLECTANCE

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vit+CD+DC	I	SC+MM
'rc'	RC7446	GSQ Records 1973/28 and 1974/6	100	1·46	5·5	20·6	32·7 41·2
'ws'	0·65					21·8	44·2 55·8
'rc'	RC7447		93·6	1·32	7·6	5·9	34·7 59·4
'ws'	0·81					6·4	40·1 59·9
'rc'	RC7448		100	1·42	7·1	16·8	31·4 44·6
'ws'	0·66					18·2	41·3 58·7
160F	RC7544 -7550		79·5	1·35	7·2	8·5	32·2 52·1
'ws'	2·70					9·2	38·2 61·8
'rc'	RC7589		96·3	1·50	6·8	2·2	28·3 43·0
'ws'	2·70					22·1	39·7 60·3
160F	NS6 RC6891				5·2	9·7	52·4 62·7
'ws'	1·35					10·2	39·1 61·9
'rc'	RC6891				5·2	23·7	38·0 41·7
'ws'	1·35					26·5	40·1 59·9
160F	RC6892				5·4	10·5	30·1 39·5
15	0·91					11·2	34·0 64·0
'rc'	RC6892			1·41	5·4	7·7	28·3 38·6
15	0·91					8·7	36·8 61·2
160F	RC6873				1·9	6·0	34·9 52·5
'ws'	1·04					16·3	43·0 57·0
'rc'	RC6873			1·50	1·9	15·3	34·7 47·5
'ws'	1·04					16·8	42·0 58·0
160F	RC6901				3·2	7·3	37·1 52·4
'ws'	1·15					7·5	41·5 59·5
'rc'	RC6901			1·37	3·2	10·8	35·5 52·5
160F	1·15					11·1	41·3 58·7

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'rc'	RC7446	GSQ Records 1973/28 and 1974/6	100	1·46	5·5	20·6	32·7	41·2						24·05	1	0·98			NS24 0·012					NS24 72·7	3·1		
						db								daf		daf											
'ws'	0·65					21·8	44·2	55·8						32·54		5·34								5·5	1·1		
'rc'	RC7447		93·6	1·32	7·6	5·9	34·7	51·8						28·82	3	0·64			NS27 0·007					NS27 36·8	22·9		
						db								daf		daf											
'ws'	0·81					6·4	40	59·9						33·32		0·74								1·6	1·1		
'rc'	RC7448		100	1·42	7·1	16·8	31·4	44·6						25·19	1	0·07											
						db								daf		daf											
'ws'	0·66					18·2	41·3	58·7						33·14		0·93											
160F	RC7544 -7550		79·5	1·35	7·2	8·5	32·2	52·1						28·01		0·53			0·001	0·004				57·7	32·7		
						db								daf		daf											
'ws'	2·70					9·2	38·2	61·8						33·30		0·63								1·8	1·1		
'rc'	RC7589		96·3	1·50	6·8	2·2	28·3	43·0						22·84													
						db								daf													
'ws'	2·70					22·1	39·7	60·3						32·03													
160F	NS6 RC6891				5·2	9·7	52·4	62·7						28·52	1	0·52											
						db								daf		daf											
'ws'	1·35					10·2	39·1	61·9						33·97		0·67			NS10 0·004	NS6 0·001				56·7	29·7		
'rc'	RC6891				5·2	23·7	38·0	41·7						22·66		0·07											
						daf								daf		daf											
'ws'	1·35					26·5	40·1	59·9						37·95		0·08											
160F	RC6892				5·4	10·5	30·1	39·5						27·76	1	0·04											
						db								daf		daf											
15	0·91					11·2	34·0	64·0						30·04		0·54											
'rc'	RC6892			1·41	5·4	7·7	28·3	38·6						25·10		0·52			NS31 0·005								
						db								daf		daf											
15	0·91					8·7	36·8	61·2						32·60		0·64											
160F	RC6873				1·9	6·0	34·9	52·5						32·60	6	0·64			0·068								
						db								daf		daf											
'ws'	1·04					16·3	43·0	57·0						27·78	5	2·72											
'rc'	RC6873			1·50	1·9	15·3	34·7	47·5						34·07	6	3·12											
						db								daf		daf											
'ws'	1·04					16·8	42·0	58·0						30·15		1·28											
160F	RC6901				3·2	7·3	37·1	52·4						34·76		2·43			0·080								
						db								daf		daf											
'ws'	1·15					7·5	41·5	59·5						29·33	5½	2·15											
'rc'	RC6901			1·37	3·2	10·8	35·5	52·5						34·10		2·51											
160F	1·15					11·1	41·3	58·7																			

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: Parrot Creek
Cairns County NS33 Talbot NS69/10

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Pleiades	152·46		1·04	GSQ Record 1975/34
Aquila	153·50			
	186·97		1·32	
Tieri	188·34			
Corvus	262·44		1·99	
German Creek	264·43			
	41·34		2·86	
German Creek	T69-70			
	44·29			

MACROSCOPIC — MICROLITHOTYPE - VOL % — MACERAL - WT % — REFLECTANCE

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vit+CD+DC	I	SC+MM
'rc'	RC8279	GSQ Record 1975/34	100	1·41	1·2	16·7	16·7 64·2
'ws'	1·04					16·1	20·7 79·9
'us'	RC8314		100	1·50	1·6	26·0	16·2 56·2
'rc'	1·42					26·4	22·4 77·6
150F	PS1134		80·4	1·70	2·1	7·0	21·2 71·8
'ws'	1·99					7·7	23·3 76·7
	T69-70						
160F	PS1187		88·4	1·72	1·9	7·2	19·9 72·9
'ws'	2·86					7·9	21·2 78·8
'us'	PS1161		100	1·70	1·5	15·5	
'ws'	2·86					32·1	8 67·9

Sample type	Sample Number	Source	R_o max
150F	RC8279	GSQ Record 1975/34	1·75
	T69-70		
160F	PS1187		1·32

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'rc'	RC8279	GSQ Record 1975/34	100	1·41	1·2	16·7	16·7	64·2						29·34		0·40			0·100								
						db								daf		daf											
'ws'	1·04					16·1	20·7	79·9						35·39		0·72											
'us'	RC8314		100	1·50	1·6	26·0	16·2	56·2						25·17	4½	1·50			0·030								
						db								daf		daf											
'rc'	1·42					26·4	22·4	77·6						34·77		2·07											
150F	RC8290 -8291		80·4	1·37	1·2	9·7	15·2	74·5						32·23	7½	0·84			0·146								
						db								daf		daf											
'ws'	1·99					9·2	16·9	83·1						35·93		0·94											
	T69-70																										
160F	RC8457		88·4		1·1	8·6	23·6	67·3	80·5	4·5	3·1	1·9	0·9		9	0·81	0·46	0·43	0·048				0·06	51·6	33·3		
						db										daf											
'ws'	2·86					9·9	26·0	74·0	88·6	4·9	3·4	2·1	1·0			0·960	500	0·46						1·5	1·1		
'rc'	RC8457				1·4	14·9	21·7	62·0								1·26			0·059								
						db										daf											
'ws'	2·86					15·3	25·9	74·1								1·50											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
GERMAN CREEK FORMATION
LOCATION: German Creek
Utah Borehole 13841 C

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
German Creek	78		2·77	CSIRO LR390

MACROSCOPIC — MICROLITHOTYPE - VOL % — MACERAL - VOL % — REFLECTANCE

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vit+CD+DC	I	SC+MM
'ccc'	LN42309	CSIRO LR390		62	18	11	9
'us'	2·68			68	20	12	

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'ccc'	LN42309	CSIRO LR390		1·38	1·6	12·3	21·7	64·4	74·9	4·4	4·4	1·8	0·4	30·59	>9	1·15	0·71	0·44	0·068		0·06	12	0·06	45·7	36·7	10	5
						db								daf		daf											
'us'	2·68					12·5	25·2	74·8	81·0	5·1	5·3	2·1	0·5	33·54		1·34	0·82	0·52						1·3	1·1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Norich Park
Calrns County NS 67

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Norich Park
Calrns County NS 67

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
P1				GSQ Record 1980/150
	284·71			
P2	76		0·95	
	285·66			
	300·54			
Harrow Creek Upper	82		1·97	
	302·51			
	361·08			
Harrow Creek	75		3·85	
	364·93			
Dysart Rider				
	433·01			
Dysart	76		4·52	
	437·59			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD-DC	I	SC+MM
160F	PS1755	CSIRD Permian coals study	64·1	63	17 mmf	15	5
WS	0·45			66	18	16	
160F	PS1756 -1758		85·6	59	27 mmf	9	5
WS	1·97			62	28	10	
160F	RC11532 -11533 3·85		80·2	60	21 mmf	14	5
WS	4·52			63	22	15	

MACERAL - WT. %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
160F	PS1756	GSQ Record 1980/150	64·1	65 mmf	21	14
WS	·45			76	24	
160F	PS1756 -1758		85·6	72 mmf	16	12
WS	1·97			82	18	
160F	RC11532 -11533 3·85		80·2	66 mmf	22	12
WS	4·52			75	25	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
160F	PS1755	GSQ Record 1980/150	1·82
160F	PS1756		1·85
160F	RC11532 -11533 3·85		1·98
160F	RC11535 -11536 4·52		2·22

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
160F	RC11529	GSQ Record 1980/150	64·1	
WS	0·95			
FC	RC11529		100	1·57
160F	RC11530		85·6	
WS	1·97			
FC	RC11530		100	1·44
160F	RC11532 -11533 3·85		73·8	1·60
FC	RC11532 -11533		100	1·52
160F	RC11535 -11536 4·52		80·2	1·60
FC	RC11538		100	1·51

PROXIMATE wt % ad

M	A	VM	FC
1·3	13·9 db 14·1	13·6 daf 16·0	71·2 daf 84·0
	29·2		
1·3	11·6 db 11·8	13·9 daf 16·0	73·2 daf 84·0
	18·7		
1·2	12·0 db 12·1	13·7 daf 14·9	73·9 daf 85·1
	25·6		
1·4	9·5 db 9·6	12·0 daf 13·5	77·1 daf 86·5
	21·1		

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
30·55 daf 36·03	1
31·55 daf 36·22	1½
31·45 daf 36·23	
32·21 daf 36·15	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
1·00 daf 1·17							
0·67 daf 0·77							
0·81 daf 0·93			0·045				
0·53 daf 0·59			0·053				

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ge ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Peak Downs South
Calrns County NS 71 and 62

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Peak Downs South
Calrns County NS 71 and 62

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
S Upper	90·68	NSW	1·24	
	91·92			
S Lower	125·49	NSW	2·06	
	127·55			
R				
Q Upper				
	281·00			
Q Lower			1·20	
	282·20			
	319·48			
P1	85		1·50	GSQ Record 1980/150
	320·98			
	329·76			
P2			1·07	
	330·83			
	375·27			
Harrow Creek			7·58	
	382·85			
	418·98			
Harrow Creek Lower			3·31	
	423·09			
	447·16			
K			1·82	
	448·98			
Dysart Upper 1	481·07		1·07	
	484·08			
	486·37			
Dysart			3·61	
	489·98			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD-DC	I	SC+MM
160F	RC11647	CSIRD Permian coals study	94·8	76 mmf	14	10	0
WS	1·50			76	14	10	
150F	PS1716 -1721 7·58		76·8	52 mmf	19	25	4
WS				54	20	26	
150F	PS1722 -1724 3·31		72·4	66 mmf	16	15	3
WS				68	17	15	
150F	RC11658		85·1	79 mmf	10	8	2
WS	1·07			81	10	8	
150F	PS1724 -1725 3·61			66 mmf	18	13	
WS				68	19	13	

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
160F	RC11647	GSQ Record 1980/150	94·8	78 mmf	14	8
WS	1·50			85	15	
150F	PS1716 -1721 7·58		76·8	61 mmf	30	9
WS				67	32	
150F	PS1722 -1724 3·31		72·4	70 mmf	20	10
WS				78	22	
150F	RC11658		85·1	79 mmf	14	7
WS	1·07			85	15	
150F	RC1724 -1723 3·61		85·4	74 mmf	19	7
WS				80	20	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
160F	RC11647	GSQ Record 1980/150	1·49
150F	RC11653		1·70
150F	PS1722		1·76
150F	RC11658		1·96
150F	RC11660		1·94

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
160F	RC10986	GSQ Record 1980/150	59·7	
WS	1·24			
FC	RC10986		100	1·65
160F	RC10987 -10988		58·4	
WS	2·06			
FC	RC10987 -10988		100	1·65
160F	RC11646		57·3	
FC			100	1·63
WS	1·20			
160F	RC11647		94·8	
WS	1·50			
FC	RC11647		100	1·36
160F	RC11648		63·8	
FC	RC11648		100	
WS	1·07			
150F	RC11649 -11653 7·58		76·8	
WS				
FC	RC11649 -11653			
150F	RC11665 -11667 3·31		72·4	
WS				
FC	RC11665 -11667		100	1·51
150F	RC11773		66·4	
WS	1·82			
FC	RC11773		100	1·53
150F	RC11658		85·1	
WS	1·07			
FC	RC11658		100	1·42
150F	RC11659 -11661 3·61		83·4	1·50
WS				
FC	RC11659 -11661		100	1·48

PROXIMATE wt % ad

M	A	VM	FC
2·3	23·5 db 24·1	19·9 daf 26·8	54·3 daf 73·2
	38·1		
2·1	19·0 db 19·4	21·1 daf 26·7	57·8 daf 73·3
	37·9		
	16·9 32·8		
1·2	7·8 db 7·9	19·7 daf 21·6	71·3 daf 78·4
	9·6		
	20·5 30·5		
1·3	9·0 db 9·1	16·0 daf 17·4	73·3 daf 82·1
	20·1		
	9·1 db 9·3	13·4 daf 15·1	75·6 daf 84·9
	23·5		
1·0	6·5 db 6·6	16·1 daf 17·9	76·4 daf 82·6
	14·4		
1·0	6·7 db 6·8	15·8 daf 17·1	76·5 daf 82·9
	12·2		

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
24·79 daf 34·11	7½
28·43 daf 36·03	*
32·85 daf 36·09	>9
32·76 daf 36·52	
32·60 daf 36·28	
33·58 daf 36·30	>9
33·24 daf 36·01	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·52 daf 0·54							
0·54 daf 0·56			0·078				
0·54 daf 0·56			0·027				
0·52 daf 0·54			0·007				
0·47 daf 0·52							
0·46 daf 0·66			0·027				
0·52 daf 0·56			0·084				

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ge ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: North Peak Downs
Cairns County NS 13

..PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: North Peak Downs
Cairns County NS 13

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
R	251.76		1.48	GSQ Record 1980/50
	254.18			
	256.47		1.00	
	257.47			
	316.48			
P	84		3.89	
	318.27			
	358.44			
Harrow Creek	62		3.68	
	362.12			
	399.81			
Harrow Creek Lower			7.07	
	406.88			
	439.26			
Dysart Upper	81		3.40	
	442.66			
	476.79			
Dysart			6.15	
	483.94			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
150F	RC7521	CSIRO Permian coals study	75.0	60	21 mmf	17	2
WS	3.89			61	22	17	
150F	RC7524 -7526		78.4	45	21 mmf	30	4
WS	3.68			47	22	31	
150F				80	8 mmf	11	1
				81	8	11	

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
150F	RC7521	GSQ Record 1980/50	75.0	76 mod	15	9
WS	3.89			84	16	
150F	RC7524 -7526		78.4	56 mod	34	10
WS	3.68			62	38	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
150F	RC7521	GSQ Record 1980/50	1.40
150F	RC7524 -7526		1.51

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
150F		GSQ Record 1980/50	51.5	1.40
FC			100	1.61
WS	1.48			
150F	RC7521		75.0	1.37
WS	3.89			
RC	RC7521		100	1.55
150F	RC7524 -7526		78.4	1.37
WS	3.68			
RC	RC7524		100	1.48

PROXIMATE wt % ad

M	A	VM	FC
1.40	15.6		
1.61	33.4		
1.6	11.2 db	19.5 daf	67.7 daf
	11.3	22.3	77.7
	23.4		
1.4	16.0 db	18.4 daf	70.2 daf
	19.6	20.8	79.2
	19.7		

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
	5½
31.46 daf	0.46 daf
36.08	0.53
31.84 daf	0.42 daf
35.94	0.54

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
			0.046				
			0.145				

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Kemmis Creek
Wodehouse NS 1

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Kemmis Creek
Wodehouse NS 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
No1	259.08		1.52	GSQ Record 1972/5
	260.60			
	309.95			
No2.			2.62	
	312.47			
	343.18			
No3			1.80	
	344.98			
	389.74			
No4			1.48	
	390.22			
	470.74			
No5			1.57	
	472.34			
	582.93			
No6			2.59	
	585.52			
	645.88			
No7			2.69	
	688.57			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
		GSQ Record 1972/5				

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
RC	RC6656 -6657	GSQ Record 1972/5	100	1.66
WS	1.52			
150F	RC6656 -6657		55.4	1.72
WS	1.52			
RC	RC6658 -6661		100	1.79
WS	2.62			
150F	RC6658 -6661		47.4	1.46
WS	2.62			
RC	RC6662 -6664		100	1.74
WS	1.80			
150F	RC6663 -6664		41.5	1.48
WS	1.80			
RC	RC6665 -6666		100	1.92
WS	1.48			
150F	RC6665			1.55
WS				
RC	RC6667		100	1.52
WS	1.57			
150F	RC6667		81.9	1.41
WS	1.57			
RC	RC6668 -6671		100	1.74
WS	2.59			
150F	RC6668 -6671		61.1	1.43
WS	2.59			
RC	RC6672 -6674		100	1.67
WS	2.69			
150F	RC6672 -6674		71.7	1.45
WS	2.69			

PROXIMATE wt % ad

M	A	VM	FC
	37.4		
	12.3		
	42.2		
	15.8		
	39.1		
	16.8		
	27.0		
	13.8		
	14.3		
	9.9		
	24.6		
	10.6		
	28.8		
	11.0		

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Peak Downs
Cairns County 63

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Peak Downs
Cairns County 63

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: S Upper; S Lower; R; Q Upper; Q Lower; P1; P2; Harrow Creek; Dysart Upper; Dysart

Depth – Vit % mmf: 95.19; 96.58; 136.26; 138.32; 167.71; 169.52; 199.12; 201.15; 278.72; 291.46; 315.40; 315.04; 399.79; 399.79; 455.60

Section

Thickness: 1.39; 2.06; 1.82; 1.84; 1.05; 12.74; 4.84

Source: GSQ Record 1980/150

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
WS	12-74	RC11011 -11019		42	58		
WS	164	RC11030		84	16		
WS	4.84	RC11031 -11033		71	29		

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
1.50F	RC11011 -11019	GSQ Record 1980/150	68.5	62.5 mmf	25.11	
1.50F	RC11030		60.0	77.5 mmf	15.8	
1.50F	RC11031 -11033			65.27 mmf	8	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
1.50F	RC11015	GSQ Record 1980/150	1.52
1.50F	RC11030		1.58
1.50F	RC11031		1.67

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
1.50F	RC11011 -11019	GSQ Record 1980/150	68.5	1.50
WS	12-74	RC11011 -11019		1.53
1.50	RC11030		60.0	
WS	164	RC11030		1.65
1.50F	RC11031 -11033		72.9	1.50
WS	4.84			1.51

PROXIMATE wt % ad

M	A	VM	FC
1.1	11.4	18.2	69.3
	db 11.5	daf 20.8	79.2
	25.4		
1.1	7.6	19.4	73.0
	db 7.7	daf 21.2	78.8
	39.1		
1.1	8.0	17.4	73.5
	db 8.1	daf 19.7	80.3
	22.1		

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
31.66 daf 36.18	
33.18 daf 36.34	>9
33.01 daf 36.31	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.58 daf 0.64			0.019				
0.56 daf 0.61			0.006				
0.55 daf 0.61			0.044				

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Mount Flora East
Killarney NS 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

Depth – Vit % mmf: 98.66; 99.82; 100.91; 102.26; 124.74; 125.83; 204.76; 206.12; 256.71; 261.51; 283.46; 284.61; 306.35; 307.72

Section

Thickness: 1.14; 1.35; 1.04; 1.37; 1.04; 1.13; 1.14

Source: GSQ Record 1972/15

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
WS	RC6855						
RC	1.14						
WS	RC6856						
RC	1.35						
WS	RC6857						
RC	1.04						
WS	RC6858						
RC	1.37						
WS	RC6859						
RC	1.04						
WS	RC6860						
RC	1.13						
WS	RC6861						
RC	1.14						

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
WS	RC6855	GSQ Record 1972/15	100	1.77
RC	1.14			
WS	RC6856		86.7	1.78
RC	1.35			
WS	RC6857		85.6	1.75
RC	1.04			
WS	RC6858		100	1.71
RC	1.37			
WS	RC6859		100	1.57
RC	1.04			
WS	RC6860		98.9	1.66
RC	1.13			
WS	RC6861		98.9	1.75
RC	1.14			

PROXIMATE wt % ad

M	A	VM	FC
2.2	42.8	8.2	55.2
	db 43.8	daf 15.9	84.1
	43.8		
2.0	45.4	7.2	55.4
	db 46.3	daf 13.7	86.3
1.4	41.5	8.4	48.0
	db 42.3	daf 15.2	84.8
2.2	36.6	7.6	55.4
	db 37.6	daf 12.4	87.6
2.1	20.8	6.4	70.7
	db 21.2	daf 8.3	91.7
1.8	31.1	8.4	59.7
	db 31.7	daf 12.5	87.5
2.2	37.7	6.9	55.2
	db 38.5	daf 11.5	88.5

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
17.58 daf 28.63	
17.07 daf 32.45	
17.89 daf 31.61	
20.38 daf 33.30	
26.77 daf 34.72	
22.75 daf 33.90	
20.19 daf 33.59	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.81 daf 1.32							
0.52 daf 1.01							
0.49 daf 0.87							
0.68 daf 1.11							
2.59 daf 3.36							
1.95 daf 2.91							
0.88 daf 0.42							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: North Dysart
Cairns County NS 69 and 64

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source
S	143·30		5·40	GSQ Record 1980/150
	149·15			
R	173·02		1·27	
	174·29			
P1	270·32 / 78		1·56	
	271·88			
P2	282·92 / 74		1·62	
	285·54			
Harrow Creek Upper	301·73 / 85		Non	
	302·74			
Harrow Creek	337·11 / 71		5·74	
	342·85			
Harrow Creek Lower	354·16 / 74		2·59	CSIRO Permian coals study
	256·70			
J	266·75 / 79		1·50	
	268·25			
K	380·21 / 81		1·73	
	381·94			
Dysart	327·27 / 74		1·63	
	328·90			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
150F	RC11620		77·6	61	21	15	3
WS	1·56			63	22	15	
150F	RC11621		73·8	54	16	19	11
WS	1·62			65	18	22	
150F	RC11622		82·2	82	8	8	2
WS	1·01			83	8	8	
150F	PS1773 – 1775			56	22	19	3
WS	5·74			57	23	20	
150F	PS1776 – 1778			62	17	17	4
WS	2·54			64	18	18	
150F	RC11151		56·1	71	11	16	2
WS	1·50			73	11	16	
150F	RC11630		85·8	75	18	7	
WS	1·73			81	19		
150F	RC11154		53·4	66	23	11	
WS	1·63			74	26		

MACERAL - WT. %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
150F	RC11620	GSQ Record 1980/150	77·6	70	20	10
WS	1·56			78	22	
150F	RC11621		73·8	61	21	18
WS	1·62			74	26	
150F	RC11622		82·2	78	14	8
WS	1·01			85	15	
150F	PS1773 – 1775		80·1	65	27	8
WS	5·74			71	29	
150F	PS1776 – 1778		68·5	67	23	10
WS	2·54			74	26	
150F	RC11151		56·1	71	19	10
WS	1·50			79	21	
150F	RC11630		85·8	75	18	7
WS	1·73			81	19	
150F	RC11154		53·4	66	23	11
WS	1·63			74	26	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
150F	RC11620	GSQ Record 1980/150	1·58
150F	RC11621		1·62
150F	RC11622		1·69
150F	RC11623 – 11624 / RC11627		1·73 / 1·75
150F	PS1776 – 1778		1·76
150F	RC11156		1·69
150F	RC11630		1·81
150F	RC11154		1·75

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
150F	RC 11618	GSQ Record 1980/150	21·4	
AS	RC 11618 5·40		100	1·84
150F	RC11619		15·6	
AS	RC11618 1·27		100	1·77
150F	RC11620		77·6	
AS	1·56			
AS	RC11620		100	1·43
150F	RC11621		73·8	
AS	1·62			
AS	RC11621		100	1·54
150F	RC11622		82·2	
AS	1·01			
AS	RC11622		100	1·46
150F	RC11623 – 11624 / RC11627		80·1	
AS	5·74			
AS			100	1·47
150F	RC11628 / RC11629		68·5	
AS	2·54			
AS	RC11628		100	1·53
150F	RC11151		56·1	
AS	1·50			
AS	RC11151		100	1·67
150F	RC11630		85·8	
AS	1·73			
AS	RC11630		100	1·42
150F	RC11154		53·4	
AS	1·63			
AS	RC11154		100	1·63

PROXIMATE wt % ad

Sample type	M	A	VM	FC
150F	1·2	9·8 db / 9·9 daf	17·4 db / 19·8 daf	71·6 db / 80·4 daf
AS		1·97		
150F	1·2	17·5 db / 17·7 daf	15·5 db / 19·1 daf	65·8 db / 80·9 daf
AS		29·5		
150F	1·2	7·7 db / 7·8 daf	17·3 db / 18·9 daf	73·8 db / 81·0 daf
AS		15·2		
150F	1·2	8·2 ad / 8·3 db / 20·4 daf	15·4 db / 16·4 daf	75·2 db / 83·1 daf
AS				
150F	1·2	10·1 db / 10·2 daf	15·2 db / 17·1 daf	73·5 db / 82·9 daf
AS				
150F	1·0	9·7 db / 9·8 daf	17·0 db / 19·0 daf	72·3 db / 81·0 daf
AS		33·7		
150F	1·0	6·9 db / 7·0 daf	15·5 db / 16·8 daf	76·6 db / 83·2 daf
AS		14·1		
150F	0·9	10·6 db / 10·7 daf	16·5 db / 16·8 daf	72·0 db / 83·2 daf
AS		35·1		

ULTIMATE wt % ad

Sample type	C	H	O	N	S
150F					
AS					
150F					
AS					
150F					
AS					
150F					
AS					
150F					
AS					
150F					
AS					
150F					
AS					
150F					
AS					

Sample type	SE MJ/kg	CSN
150F		9
AS		1
150F		9
AS		1
150F	32·34 daf / 36·33	8½
AS		7½
150F	29·32 daf / 36·00	8½
AS		5
150F	33·10 daf / 36·33	9
AS		8½
150F	32·78 daf / 36·18	
AS		
150F	32·22 daf / 36·32	6
AS		
150F	32·26 daf / 36·72	9
AS		3½
150F	33·31 daf / 36·76	7
AS		4½
150F	31·97 daf / 32·46	9
AS		4½

MINOR wt % ad

Sample type	TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
150F	0·46 db / 0·47 daf			0·184				
AS								
150F	0·91 db / 1·19 daf							
AS								
150F	0·46 db / 0·56 daf			0·071				
AS								
150F	0·56 db / 0·62 daf			0·063				
AS								
150F	0·53 db / 0·58 daf			0·008				
AS								
150F	0·55 db / 0·62 daf			0·005				
AS								
150F	0·53 db / 0·57 daf			0·006				
AS								
150F	1·08 db / 1·22 daf			0·007				
AS								

ASH

Sample type	SiO_2 %	Al_2O_3 %
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		

TRACE

Sample type	B ppm ad	Ga ppm ad
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		
150F		
AS		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Suttor Creek
Drake NS 9 and 10

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source
Goonyella Upper	144·96		4·57	GSQ Record 1979/135
	149·53			
P	150·90 / 196·58		1·53 / 3·04 / 3·01	
	198·45			
Goonyella Middle	451·84 / 462·13		10·24	

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
150F	RC5373 – 5377		78·7	55	13	13	10
CCC	4·57			56	27	12	4
WS	RC5373 – 5377		100	47	14	14	9
CCC	4·57			49	26	14	11
150F	RC5364 – 5366		71·5	38	12	14	9
CCC	1·53			39	28	17	16
WS	RC5364 – 5366		100	50	13	24	9
CCC	1·53			47	28	17	8
150F	RC5367 – 5372		73·1	55	10	10	4
CCC	10·24			56	20	17	7
WS	RC5367 – 5372		75·7	70	10	10	10
CCC	10·24			53	20	17	10

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
150F	RC5373 – 5377	GSQ Record 1979/135	78·7	68	19	13
WS	4·57			69	31	
150F	RC5364 – 5366		71·5	62	26	12
WS	1·53			64	36	
150F	RC5367 – 5372		73·1	65	25	10
WS	10·24			66	34	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
150F	RC5373 – 5377	GSQ Record 1979/135	1·55
150F	RC5364 – 5366		1·52
150F	RC5367 – 5372		1·54

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
150F	RC5373 – 5377	GSQ Record 1979/135	78·7	1·55
CCC	4·57		106	27·6
WS	RC5373 – 5377		100	1·47
CCC	4·57		96	24·9
150F	RC5364 – 5366		71·5	1·38
CCC	1·53		39	28·1
WS	RC5364 – 5366		100	1·50
CCC	1·53		47	28·1
150F	RC5367 – 5372		73·1	1·35
CCC	10·24		103	20·7
WS	RC5367 – 5372		75·7	1·70
CCC	10·24		103	20·7

PROXIMATE wt % ad

Sample type	M	A	VM	FC
150F	1·3	10·5 db / 10·6 daf	24·3 db / 27·6 daf	63·9 db / 72·4 daf
CCC		10·6	27·6	72·4
WS	1·4	9·5 db / 9·6 daf	22·2 db / 24·9 daf	66·9 db / 75·1 daf
CCC		9·6	24·9	75·1
150F	1·2	14·9 db / 15·1 daf	22·7 db / 27·1 daf	61·2 db / 72·9 daf
WS	1·3	24·4 db / 24·7 daf	20·9 db / 28·1 daf	53·4 db / 71·9 daf
150F	1·0	10·2 db / 10·3 daf	18·4 db / 20·7 daf	70·4 db / 79·3 daf
WS	1·0	36·2 db / 36·3 daf	18·1 db / 20·7 daf	44·7 db / 79·3 daf

ULTIMATE wt % ad

Sample type	C	H	O	N	S
150F					
CCC					
WS					
CCC					
150F					
WS					
150F					
WS					

Sample type	SE MJ/kg	CSN
150F	31·44 daf / 35·65	8½
CCC	27·30 daf / 30·64	7½
WS		
CCC		
150F	30·20 daf / 34·00	8½
WS	26·15 daf / 35·46	5
150F	31·97 daf / 36·00	
CCC	29·35 daf / 47·05	
WS		
CCC		

MINOR wt % ad

Sample type	TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
150F	0·71 db / 0·82 daf							
CCC	0·70 db / 0·74 daf							
WS								
CCC								
150F	0·45 db / 0·52 daf							
WS	0·58 db / 0·84 daf							
150F	0·47 db / 0·58 daf							
WS	0·58 db / 0·73 daf							
150F	0·47 db / 0·58 daf							
CCC	0·73 db / 0·93 daf							
WS	0·46 db / 0·58 daf							
CCC	0·73 db / 0·93 daf							

ASH

Sample type	SiO_2 %	Al_2O_3 %
150F		
CCC		
WS		
CCC		
150F		
WS		
150F		
CCC		
WS		
CCC		

TRACE

Sample type	B ppm ad	Ga ppm ad
150F		
CCC		
WS		
CCC		
150F		
WS		
150F		
CCC		
WS		
CCC		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Norich Park
Cairns County NS 38

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Norich Park
Cairns County NS 38

PETROGRAPHIC ANALYSES

MACROSCOPIC — STRATIGRAPHY; Depth Vit % mmf; Section; Thickness; Source

S Upper
S Lower
P1
P2
Harrow Creek Upper — 343·21
Harrow Creek — 346·11 — 373·99 — 1·90 — GSQ Record 1980/50
Harrow Creek Lower — 376·13 — 2·14 — GSQ Record 1980/50
Dysart Rider — 336·52 — 0·78 — GSQ Record 1980/50
J — 337·30
462·69
Dysart — 464·46 — 1·77 — GSQ Record 1980/50

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wl %; V+C; Vt+CD-DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wl %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
160F	RC8480 -8481		79·5	1·41	1·4	12·9 db	12·6 daf	73·1 daf						30·95 daf 36·11		0·55 daf 0·64										
MS'	1·90					13·0	14·7	85·3																		
RC	RC8480 -8481		100	1·54		25·2																				
160F	RC8483 -8484		64·8	1·39	1·5	12·4 db	12·4 daf	73·1 daf						31·01 daf 36·02		0·54 daf 0·63										
WS	2·14					12·6	14·4	85·6																		
160F	RC8485 0·78		76·6	1·39		10·5									3·5											
RC	RC8485 0·78					23·4																				
160F	RC8487 -8488		69·2	1·41	1·2	11·1 db	11·3 daf	76·4 daf						31·35 daf 35·35		0·52 daf 0·59										
MS	1·77					11·2	12·9	87·1																		
RC	RC8487 -8488		100	1·52		27·7																				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Moranbah
Grosvenor NS 44 and 45

PETROGRAPHIC ANALYSES

MACROSCOPIC — STRATIGRAPHY; Depth Vit % mmf; Section; Thickness; Source

Fairhill — 119·92 — 2·26 — 125·74 — 2·19 — 153·96
Q Upper — 1·42 — 155·29
Q Lower — 216·00 — 2·01
P — 220·02 — 2·00 — 264·46 — GSQ Record 1978/49
Harrow Creek — 269·81 — 5·41 — GSQ Record 1978/49
Dysart Upper — 330·43 — 1·09 — 331·52
Dysart Rider — 350·56 — 0·82 — 351·50
Dysart Lower — 480·04 — 3·21 — 583·24 — GSQ Record 1978/49

CSIRO Permian coals study

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wl %; V+C; Vt+CD-DC; I; SC+MM

MACERAL - WT %: Sample type; Sample number – Thickness analysed; Source; Recovery of wl %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
160F	NS44N RC9036		73·4		2·0	22·0 db 22·4	23·5 daf 5·3	52·2 daf 68·7						27·23 daf 35·83		0·79 daf 0·96			0·013							
WS'	1·29																									
160F	NS49R RC9198				2·4	22·7 db 23·3	21·4 daf 28·6	53·5 daf 71·4						28·86 daf 38·53		0·64 daf 0·85			0·017							
1S'	2·55																									
140F	RC9002		54·5	1·35	1·7	9·9 db 10·1	25·7 daf 29·1	62·7 daf 70·9						31·79 daf 35·96	9	0·57 daf 0·64			0·009							
WS'	1·43		54·5																							
140F	RC8920		74·5	1·34	1·4	10·1 db 10·2	24·5 daf 27·7	64·0 daf 72·3						31·98 daf 36·14	9	0·56 daf 0·61			0·031							
WS'	2·02																									
140F	RC8920 -8921		62·1		1·4	11·0 db 11·2	23·8 daf 27·2	63·8 daf 72·8						31·66 daf 36·14	9	0·52 daf 0·59			0·033							
WS'	4·02																									
140F	RC9003				1·5	12·7 db 12·9	22·9 daf 26·5	63·4 daf 73·5						31·22 daf 36·18	9	0·50 daf 0·58			0·032							
1S'	2·00																									
150F	NS44 PS1312		69·3	41 29 24	6	145F	NS44 PS1312		69·3	70 18	12	145F			116												
WS	3·81			43 31 26		WS	3·81			83 mmf 20		1S														
150F	NS44 PS1273		48	25 22	5	150F	RC8924 -8927		65·4	58 32	10	150F			123												
WS	4·75		51	2mmf 22		WS'	5·47			64 mmf 36		WS														
						TC'	RC8924 -8927		100	46 26	28																
						WS'	15·41			64 mmf 36																
150F	NS44 PS1400		54·3	41 31	19 1	150F	NS44 PS1400		54·3	45 42	13	150F	NS45		141												
WS	3·62			50 31	19	WS	3·62			52 mmf 48		WS														
150F	RC8939		73·7		1·8	10·6 db 10·8	14·5 daf 22·5	68·1 daf 77·7						31·52 daf 35·48	8½	0·52 daf 0·59			0·011							
WS'	1·09																									
TC'	NS44 RL6868		100	1·44	1·2	18·7 db 18·9	20·1 daf 25·8	60·0 daf 74·9						28·87 daf 36·64	9	0·56 daf 0·70			0·30							
WS	1·21																									
150F	NS45 RL10006		58·3		1·3	13·0 db 13·2	17·7 daf 20·7	69·0 daf 79·3						31·02 daf 36·20	7½	0·45 daf 0·53			0·038							
WS'	3·21																									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Moranbah
Grosvenor NS 44 and 45

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Saraji
Cairns County NS 10

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Saraji
Cairns County NS 10

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source
S Upper	170·43			
S Lower				
R				
Q Upper	171·60		1·17	GSQ Record 1980/50
Q Lower	185·91		1·14	
P	187·08		1·46	
	216·76		1·62	
Harrow Creek	217·24		0·63	
	238·13			
Harrow Creek Lower	241·01			
Harrow Creek Lower 1	284·53		1·69	
J	286·22			
Dysart	386·22		4·29	
	390·51			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	V+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max
160F	RC7487		1·67
160F	RC7489		1·73
160F	RC7494		1·83
160F	RC7495		2·00

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
160F	RC7487		59·5	1·41
RC	"		100	1·65
WS	1·17			
160F	RC7488		89·4	1·45
RC	"		100	1·63
WS	1·17			
160F	RC7489		89·4	1·36
WS	1·46			
RC	RC7489		100	1·42
160F	RC7491 + 7493		74·1	1·41
CCC	2·2·5			
CCC	RC7491 + 7493		100	1·62
WS	2·2·5			
160F	RC7494		69·9	1·40
WS	1·69			
RC	RC7494		100	
160F	RC7495 + 7493		64·2	1·38
WS	4·29			
RC	RC7495		100	1·50

PROXIMATE wt % ad

M	A	VM	FC
1·8	16·1		
	33·4		
1·6	8·3		
	12·0		
0·8	8·2	17·0	74·0
	db 8·3	daf	daf
	12·0	18·1	81·3
	11·0		
	23·9		
0·8	11·6	14·0	73·6
	db 11·7	daf	daf
	24·9	16·0	84·0
0·8	10·0	14·1	75·1
	db 10·1	daf	daf
	18·7	15·8	84·2

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
	8
	3
	8½
	7½
31·98	8½
daf 35·14	7½
	5½
30·57	1
daf 34·89	
	2
31·25	
daf 35·03	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
1·00			0·047				
daf 1·10							
0·38			0·017				
daf 0·43							
0·34			0·008				
daf 0·38							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

GSQ Record 1980/50

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Newlands
Drake NS 18 and 24

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Newlands
Drake NS 18 and 24

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source
Goonyella Upper	144·35	NS16	2·23	GSQ Record 1976/17
	146·58			
P	234·49	NS16		
	236·75			
	313·18			
Goonyella Middle		NS16	5·62	
	318·80			
	199·87		1·22	
Goonyella Lower		NS24	4·93	
	195·35			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	V+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
15'	RC6742 + 6744		160	1·40
RC	2·23			
160F	RC6748 + 6754		78·2	1·37
WS	5·62			
160F	RC6748 + 6750-54		61·7	1·40
CCC	6·15			

PROXIMATE wt % ad

M	A	VM	FC
1·5	16·1	21·7	60·7
	db 16·3	daf 26·3	73·7
1·1	9·2	18·8	70·9
	db 9·3	daf 20·4	79·1
1·1	14·1	16·4	68·4
	db 14·3	daf 19·3	80·7

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
29·10	
daf 36·04	
32·17	
daf 35·86	
29·61	
daf 34·92	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·93							
ORD							
1·54							
0·48							
daf 0·54							
0·51							
0·43							
daf 0·51							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

GSQ Record 1976/17

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Moranbah
Grosvenor NS 23 and 17

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Moranbah
Grosvenor NS 23 and 17

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth m / Vit % mmf; Section; Thickness; Source

Q — 136.83 — 141.47 — 2.63 — 2.01 — GSQ Record 1978/149

P — 189.68 — 193.51 — 3.83 — GSQ Record 1978/149

Harrow Creek — 236.72 — 245.66 — 4.94 — GSQ Record 1978/149

Harrow Creek Lower — 268.22 — 271.78 — 2.56 — GSQ Record 1978/149

Dysart Upper — 297.06 — 298.05 — 0.99

Dysart Rider — 330.71 — 332.87 — 2.08

Dysart Lower — 349.44 — 351.82 — 2.36

MICROLITHOTYPE - VOL %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+C; Vit+CD+DC; I; SC+MM

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
135F	PS533	CSIRO Permian coals study	71.4	47	30	23	
WS	7.06			47	30	23	

MACERAL - WT %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+E; I; MM

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM
135F	PS533	QGMJ 74	71.4	67	29	4
WS	7.06			70	30	
CCC	PS466 - 472	QGMJ 76	100	55	33	12
WS	7.06			62	38	
135F	PS534			62	32	8
CCC	7.43			66	34	
CCC	PS480 - 482			45	35	20
WS	7.43			56	44	

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Sample type	Sample Number	Source	R_o max
SUB	PS460	QGMJ 76	1.24

CHEMICAL ANALYSES

Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
160F	RC8248				1.8	16.9	24.0	57.3						29.18		0.62			0.013	0.008							
WS	2.63					19.2	daf 29.5	daf 70.4						daf 35.89		daf 0.74											
150F	RC8249				1.5	12.4	24.3	61.8						30.82		0.63			0.008							
WS	2.01					db 12.6	daf 28.2	daf 71.8						daf 35.30		daf 0.73											
160F	RC8184	GSQ Record 1978/149			1.6	15.7	22.6	60.1						29.63	7½	0.59			av. 0.015								
WS	3.83					db 11.0	daf 27.9	daf 72.7						daf 35.83		daf 0.65											
150F	RC8341 - 8345		67.3		1.2	8.9	22.7	67.2						32.09	8½	0.56			0.035								
MS	4.94					db 9.0	daf 25.3	daf 74.7						daf 35.70		daf 0.62											
RC	RC8341 - 8345		100	1.44		17.6																					
MS	4.94																										
160F	RC4612	WS17 GSQ Record 1978/149	57.7		1.9	19.0	19.3	59.8								0.57			0.048								
WS	2.56					db 19.4	daf 24.4	daf 75.6								daf 0.66											
150F			43.2			16.3																					
150F	RC8143		76.3	1.34	1.1	10.1	19.7	69.1						32.09	9	0.55			0.103								
WS	2.08					db 10.2	daf 22.2	daf 77.8						daf 36.14		0.62											
150F	RC8144		60.3	1.34	1.0	10.4	19.0	69.6						32.14	9	0.56			0.01								
WS	2.36					db 10.5	daf 21.4	daf 78.6						daf 36.26		0.63											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Red Hill
Grosvenor NS 10 and 37 R

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Red Hill
Grosvenor NS 10 and 37 R

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth m / Vit % mmf; Section; Thickness; Source

Moranbah Coal Measures

Goonyella Middle — 34.44 — 41.88 — 7.44 — QGMJ 74

Goonyella Lower — 56.72 — 63.78 — 7.06 — QGMJ 76

MICROLITHOTYPE - VOL %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+C; Vit+CD+DC; I; SC+MM

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
135F	PS533	CSIRO Permian coals study	71.4	47	30	23	
WS	7.06			47	30	23	
135F	PS534			38	35	26	1
CCC	7.43			39	35	26	

MACERAL - WT %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+E; I; MM

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM
135F	PS533	QGMJ 74	71.4	67	29	4
WS	7.06			70	30	
CCC	PS466 - 472	QGMJ 76	100	55	33	12
WS	7.06			62	38	
135F	PS534			62	32	8
CCC	7.43			66	34	
CCC	PS480 - 482			45	35	20
WS	7.43			56	44	

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Sample type	Sample Number	Source	R_o max
SUB	PS460	QGMJ 76	1.24

CHEMICAL ANALYSES

Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
135F	RC2824	QGMJ 74	71.4	1.26		4.4									9												
WS	7.06																										
160F	RC2829		90.3	1.30	1.2	7.6	25.8	65.4							8½	0.50											
WS	7.06					db 7.7	daf 29.3	daf 71.7								daf 0.51											
CCC	RC2824	QGMJ 74	100	1.36	1.1	12.5	24.7	62.7						30.68	8	0.52			0.019					54.8	37.2		
WS	7.06					db 12.6	daf 28.6	daf 71.4						daf 35.51		daf 0.61								1.5	1		
150F	RC2855	QGMJ 76	73.2	1.35	1.9	10.4	21.5	66.2						31.94	7½	0.52			0.010		0.037						
CCC	7.34					db 10.6	daf 24.5	daf 75.5						daf 36.42		daf 0.65								NSSTR			
CCC	RC4662 RC2855		143		1.6	19.5	20.3	58.6								0.53								2.6	1.2		
WS	7.43					db 10.8	daf 25.8	daf 74.2								daf 0.67											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Lenton Downs
Grosvenor NS 2

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Goonyella Upper	248.06		3.25	GSQ Record 1974/35
	251.31			
Goonyella Middle	349.40		6.02	
	355.42			
Goonyella Lower	421.46		5.95	
	427.41			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
	RC6367 – 6370 3.25		82	1.38	1.3	14.0	22.4	64.9						30.57		0.57											
						14.6	26.6	73.4						36.03		0.67											
	RC6367 – 6370 3.25		100	1.50	1.7	23.4 db	20.5 daf	54.9						26.76 daf		0.80 daf											
						23.8	21.4	72.6						35.13		1.07											
	RC6371 – 6376 6.02	GSQ Record 1974/35	82.2	1.36	1.2	10.5 db	19.2 daf	69.1						31.83 daf		0.48 daf											
						10.6	21.7	78.3						36.05		0.54											
	RC6371 – 6376 6.02		100	1.49	1.2	20.5 db	18.2 daf	60.1						27.46 daf		0.80 daf											
						20.7	23.2	76.8						35.07		0.91											
	RC6377 – 6383 5.95		177.2	1.41	1.0	12.3 db	17.4 daf	69.3						31.18 daf		0.52 daf											
						12.4	20.1	79.9						35.96		0.60											
	RC6377 – 6382 5.95		160	1.55	1.3	25.3 db	16.2 daf	57.5						25.82 daf		0.48 daf											
						25.6	22.0	78.0						35.03		0.65											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Exmoor
Hillalong NS 3 and 4

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
	84.89			
	86.11		1.22	not to scale
	136.96		4.77	GSG Record 1973/6
	190.80		1.96	
	208.18		1.38	
	210.31		2.41	
	225.55			
	227.38		1.83	
	278.79			
	285.52		6.73	
	352.50			
	355.68		3.18	
	358.65		2.97	
	360.50		1.85	
	218.54			
	224.03		5.49	
	253.91		29.88	
	254.50			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
US	RC6820 – 6821 1.96	GSQ Record 1973/6	89.1	1.47	1.4	16.6 db	12.3 daf	69.7						32.01 daf		0.62 daf											
rc						16.8	15.0	85.0						39.04		0.76											
MS	RC6822 – 6828 4.77		100	1.48	1.0	22.1 db	20.4 daf	56.5						36.17 daf		0.99 daf											
rc						22.3	26.5	73.5						47.04		1.54											
US	RC6829 – 6830 1.88		96.6	1.74	2.5	41.2 db	10.0 daf	48.3						21.89 daf	0	0.38 daf											
rc						42.3	17.8	82.2						39.06		0.67											
TS	RC6831 – 1.30		61.0	1.59	2.2	30.6 db	12.1 daf	55.1						27.66 daf	12	3.64 daf											
rc						31.3	18.0	82.0						33.72		0.95											
US	RC6837 – 6839 1.86		95.9	1.85	2.7	40.3 db	7.8 daf	49.2						16.53 daf	0	0.31 daf											
rc						41.4	15.7	84.3						29.00		0.54											
TS	RC6834 – 6835 2.44		80.0	1.59	1.5	32.9 db	17.4 daf	49.2						22.56 daf		0.36 daf											
rc						33.4	26.5	73.5						33.71		0.55											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
MORANBAH COAL MEASURES
LOCATION: Broadmeadow
Grosvenor NS 14

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit %, mmf	Section	Thickness	Source	MACROSCOPIC	MICROLITHOTYPE - VOL %						MACERAL - WT %							REFLECTANCE			
						Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Moranbah C.M. Goonyella Middle	282.94	NS14	6.03	QGMJ75								R	P5974 -992	QGMJ75		46	41	13	WS		QGMJ75	1.24
	284.53											WS	6.03			53 mmf	47					
												1.40F	P5993 -997		80.5	54 mmf	38	8				
												WS	6.03			58	42					
												1.60F	P5998 -999+			51 mmf	43	6				
												WS	997-999			56 mmf	44					

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ge ppm ad
RC	RC7240 -7241	QGMJ75		1.36	1.0	13.3	20.9	64.8						30.30 daf		0.45										
WS	6.03					db	daf							35.53		0.53										
1.40F	RC7240 -7241		80.5		1.4	7.4 db	21.9	69.3 daf						33.11 daf		0.51 daf			0.030		0.05					
WS	6.03					7.5	24.0	76.0						36.30		0.56										

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BURNGROVE AND FAIRHILL FORMATIONS, RANGAL COAL MEASURES
LOCATION: Emerald NS 2

PETROGRAPHIC ANALYSES

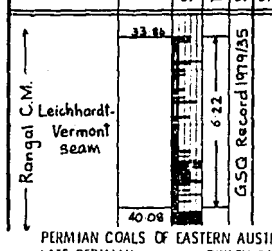
STRATIGRAPHY	Depth Vit %, mmf	Section	Thickness	Source	MACROSCOPIC	MICROLITHOTYPE - VOL %						MACERAL - VOL %							REFLECTANCE			
						Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Rangal Coal Measures — Burngrove Formation — Fairhill Formation	119.58																					
Aries seam	121.59		2.01																			
Castor seam	127.24																					
Pollux seam	131.91																					
	137.47																					
Virgo seam	166.98		1.91			1.60F	LN83184 PN35544 0.79		59.9	47	21 mmf 23	24	8	1.60F	LN83184 PN35544 0.79		59.9	56 mmf 67	26 33	14				
	167.74									51		26										
	196.50		0.58			1.60F	LN83183 PN35543 0.56		44.4	60	14 mmf 16	9	17	1.60F	LN83183 PN35543 0.56		44.4	61 mmf 81	15 19	18				
	197.06									72		12										
Leo seam	199.86		0.57			1.60F	LN83185 PN35545 0.57		46.2	66	5 mmf 6	10	19	1.60F	LN83185 PN35545 0.57		46.2	71 mmf 84	15 16	14				
	200.43									91		13										
	243.03		0.28			1.60F	LN83186 PN35546 0.49		55.3	57	15 mmf 16	16	12	1.60F	LN83186 PN35546 0.49		55.3	78 mmf 78	21 22	13				
	243.31					1.60F	LN83187 PN35547 0.75		65.1	66	16 mmf 20	18	12	1.60F	LN83187 PN35547 0.75		65.1	68 mmf 80	20 20	12				
	244.74		1.75							57		11										
Aquarius seam	244.94									66	2.1 mmf	13										
	244.13		0.46			1.60F	LN83188 PN35548 0.44		53.7	33	19 mmf 20	41	7	1.60F	LN83188 PN35548 0.44		53.7	43 mmf 45	47 51	10				
	244.67									36		44										
	244.83		0.97			1.60F	LN83189 PN35549 0.47		74	80	0 mmf 0	7	13	1.60F	LN83189 PN35549 0.47		74	95 mmf 93	12	3				
	345.80									92		8										
	373.77		3.42			1.60F	LN83190 PN35550 3.42		24.6	74	7 mmf 8	5	14	1.60F	LN83190 PN35550 3.42		24.6	80 mmf 91	14 9	6				
	377.19									87		5										
	374.85		2.38			1.60F	LN83191 PN35551 2.38		17.3	65	1 mmf 3	9	25	1.60F	LN83191 PN35551 2.38		17.3	77 mmf 93	10 7	13				
	381.71									96		11										
	382.02		2.47			1.60F	LN83192 PN35552 2.47		20.5	52	13 mmf 15	16	19	1.60F	LN83192 PN35552 2.47		20.5	62 mmf 74	22 26	16				
	384.49									65		20										
	398.59		2.96			1.60F	LN83195 PN35555 2.96		35.1	65	8 mmf 12	10	17	1.60F	LN83195 PN35555 2.96		35.1	73 mmf 86	14 14	13				
Canis seam	401.55									77		11										
4.30m interbedded dk grey slightly carbonaceous mudstone and tuffaceous mudstone.	411.51		0.71			1.60F	LN83194 PN35554 0.71		69.2	65	8 mmf 8	12	15	1.60F	LN83194 PN35554 0.71		69.2	71 mmf 83	18 17	11				
	412.22									77		15										
	431.85		1.53			1.60F	LN83197 PN35557 1.53		11.6	79	0 mmf 1	4	17	1.60F	LN83197 PN35557 1.53		11.6	83 mmf 96	4 4	13				
	433.38									95		4										
Lepus	433.47		3.35			1.60F	LN83196 PN35556 3.35		13.4	62	6 mmf 7	12	20	1.60F	LN83196 PN35556 3.35		13.4	76 mmf 90	9 10	15				
	457.22									79		14										
Fairhill	454.10		0.21			1.60F	LN83193 PN35553 0.21		65.8	47	23 mmf 26	15	15	1.60F	LN83193 PN35553 0.21		65.8	69 mmf 77	19 23	17				
Pleiades	454.31									56		19										
	516.34																					
	541.45																					
	541.55																					

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ge ppm ad
WS	RC6955			1.54		24.9									*											
1.60F				1.42	5.0	14.6 db	26.0	54.4 daf	66.2	3.6	8.5 daf	1.4	0.5	27.19 daf		0.44	0.05 daf	0.39	0.002		0.18		0.42	95.2	7.9	30	2
						15.4	32.5	61.7	92.4	4.7	10.6	1.7	0.6	33.82		0.58	0.07	0.52						10.8	1		
1.60F	LN83184 PN35544 0.79		59.9	4.0	20.5 db	25.0	50.5 daf		62.1	3.6	8.0 daf	1.4	0.4	25.14 daf		0.44	0.05 daf	0.39	0.002		0.18		0.42	95.2	7.9	30	2
	0.79				21.4	33.1	44.9		82.3	4.8	10.5	1.9	0.5	33.26		0.58	0.07	0.52						10.8	1		
1.60F	LN83183 PN35543 0.56		44.4	2.8	22.5 db	26.3	48.4 daf		60.7	3.1	8.3 daf	1.4	0.6	24.60 daf		0.60	0.04 daf	0.56	0.004		0.11		1.23	81.2	6.0	40	2
	0.56				23.1	35.2	64.6		81.3	5.0	10.8	1.9	0.8	32.96		0.80	0.05	0.75						13.5	1		
1.60F	LN83185 PN35545 0.57		46.2	3.0	22.8 db	25.2	49.0 daf		60.5	3.6	8.2 daf	1.5	0.5	24.56 daf		0.46	0.04 daf	0.35	0.003		0.14		0.42	81.3	6.2	30	2
	0.57				25.9	34.0	66.0		81.5	4.9	11.2	2.0	0.6	33.09		0.62	0.12	0.50						13.1	1		
1.60F	LN83186 PN35546 0.49		55.3	2.6	21.9 db	25.0	50.5 daf		62.4	3.7	7.2 daf	1.5	0.4	25.49 daf		0.43	0.04 daf	0.39	0.011		0.10		0.64	80.9	8.1	15	1
	0.49				22.5	33.1	66.9		82.6	4.9	10.2	2.0	0.5	33.79		0.58	0.09	0.53						10.9	1		
1.60F	LN83187 PN35547 0.75		65.1	2.6	21.7 db	27.2	48.0 daf		62.5	3.8	8.2 daf	1.6	0.4	25.60 daf		0.40	0.08 daf	0.34	0.015		0.04		0.69	78.2	8.4	15	2
	0.75				21.8	35.7	64.3		81.8	5.0	10.6	2.1	0.5	33.63		0.52	0.07	0.45						14.3	1		
1.60F	LN83188 PN35548 0.44		53.7	2.7	23.2 db	22.6	51.5 daf		61.9	3.5	6.9 daf	1.4	0.4	24.99 daf		0.43	0.05 daf	0.38	0.006		0.08		0.50	82.2	7.3	20	2
	0.44				25.8	30.5	64.5		83.6	4.7	9.4	1.9	0.5	33.70		0.57	0.06	0.51						11.3	1		
1.60F	LN83189 PN35549 0.47		7.4	2.7	10.3 db	28.4	58.6 daf		72.5	4.4	11.8 daf	1.8	0.7	29.71 daf		0.70	0.04 daf	0.66	0.003		0.06		0.31	42.0	19.0	20	2
	0.47				19.6	32.6	67.4		83.3	5.1	11.7	2.1	1.0	34.15		0.80	0.04	0.76						3.4	1		
1.60F	LN83190 PN35550 3.42		24.6	2.5	19.3 db	27.1	53.1 daf		64.6	4.1	7.2 daf	1.6	0.8	26.63 daf		0.77	0.12 daf	0.65	0.003		0.03		0.19	75.9	15.5	30	4
	3.42				19.8	32.2	67.8		76.1	4.9	10.5	1.9	1.0	34.03		0.98	0.15	0.83						4.9	1		
1.60F	LN83191 PN35551 2.38		17.3	2.7	23.1 db	25.8	48.4 daf		61.6	3.9	6.5 daf	1.6	0.8	25.27 daf		0.76	0.15 daf	0.61	0.004		0.03		0.28	84.1	9.4	40	4
	2.38				23.7	34.8	65.2		83.0	5.3	8.4	2.2	1.1	34.04		1.02	0.20	0.82						8.9	1		
1.60F	LN83192 PN35552 2.47		20.5	2.7	23.6 db	25.5	48.2 daf		64.3	3.8	6.5 daf	1.5	0.7	25.17 daf		0.68	0.11 daf	0.57	0.007		0.04		0.37	84.9	8.9	40	3
	2.47				24.4	34.0	65.4		83.2	5.2	8.7	2.0	0.9	34.14		0.92	0.15	0.77						9.5	1		
1.60F	LN83195 PN35555 2.96		35.1	2.4	21.3 db	25.0	51.3 daf		63.4	3.9	6.9 daf	1.6	0.6	25.91 daf		0.66	0.02 daf	0.54	0.008		0.04		0.34	91.6	11.2	30	3
	2.96				21.8	32.8	67.4		83.1	5.1	8.9	2.1	0.8	33.97		1.13	0.03	0.70						7.3	1		
1.60F	LN83194 PN35554 0.71		69.2	2.7	19.4 db	26.6	51.3 daf		64.8	4.0	6.8 daf	1.7	0.6	26.61 daf		0.59	0.04 daf	0.55	0.009		0.04		0.48	80.7	9.5	25	3
	0.71				19.9	34.1	65.9		86.1	5.1	8.8	2.2	0.8	34.14		0.76	0.05	0.71						8.5	1		
1.60F	LN83197 PN35557 1.53		11.6	2.3	17.1 db	28.1	52.5 daf		67.1	4.3	6.8 daf	1.7	0.8	27.85 daf		0.77	0.04 daf	0.73	0.004		0.04		0.33	77.0	12.9	25	3
	1.53				17.5	34.9	65.1		83.3	5.3	8.3	2.1	1.0	34.55		0.96	0.05	0.91						6.0	1		
1.60F	LN83196 PN35556 3.55		13.4	2.2	22.0 db	25.7	50.1 daf		63.4	3.9	6.3 daf	1.6	0.6	25.90 daf		0.65	0.03 daf	0.60	0.003		0.04		0.32	86.0	8.0	30	3
	3.55				22.5	33.9	66.1		83.5	5.1	8.5	2.1	0.8	34.17		0.93	0.04	0.74						10.8	1		
1.60F	LN83193 PN35553 0.21		65.8	1.7	24.9 db	29.9 daf	45.2		60.1	4.0	7.3 daf	1.5	1.3	24.90 daf		1.27	0.40 daf	0.46	0.006		0.03		1.47	59.8	17.2	30	4
	0.21				25.3	40.7	59.3		81.9	5.4	9.8	2.0	1.8	33.94		1.71	0.04	0.64						3.5	1		

GSQ Record 1973/28
CSIRO IR1414R
CSIRO IR1414R
CSIRO IR1414R

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Suttor Creek
Drake NS 7



PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+C; Vi+CD+DC; I; SC+MM

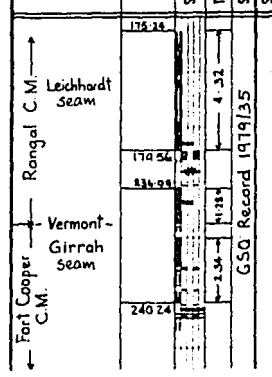
MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

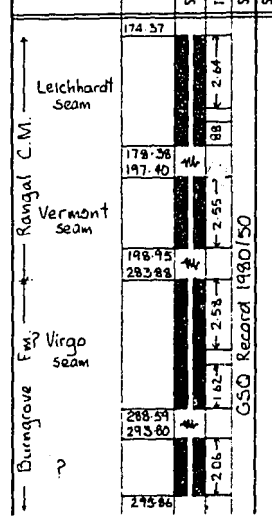
Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
140F	RC3980 6.22	GSQ Record 1979/35	63.1	1.31	3.1	8.5 db 9.8	27.9 daf 31.7	60.5 daf 68.3						30.72 daf 34.90	2.4	0.40 daf 0.46			0.028		0.03		0.04				
WS	RC3980 6.22		98.7	1.42	2.6	16.5 db 16.8	25.0 daf 31.0	55.7 daf 69.0						27.49 daf 34.06		0.93 daf 1.20											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Suttor Creek
Drake NS 12



Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
WS	RC6033 - 6037 4.32	GSQ Record 1979/35	100	1.51	2.7	20.6 db 21.2	20.6 daf 26.9	56.1 daf 73.1						25.64 daf 35.43		0.35 daf 0.46											
150F	RC6033 - 6037 4.32			1.40	2.5	12.6 db 12.9	22.9 daf 27.0	62.0 daf 73.0						24.47 daf 34.71		0.29 daf 0.34											
WS	RC6038 - 6040 3.62		100	1.70		40.8																					
160F	RC6038 - 6040 3.62			1.53		22.5																					

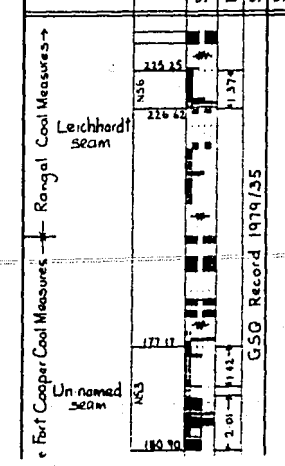
PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Saraji
Cairns County NS 11



Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
160F	RC7461 - 7465 3.52	GSQ Record 1980/50	77.2	1.41	1.9	13.8 db 14.0	20.3 daf 24.1	65.9 daf 75.9						29.17 daf 34.64		0.33 daf 0.39											
WS	3.52																										
CCC	RC7461 - 7465 3.52		100	1.69		24.9																					
WS																											
160F	RC7465		122																								
160F	RC7466 - 7469 2.55		82.1	1.42	2.0	14.7 db 15.0	19.7 daf 23.6	65.6 daf 76.4						29.43 daf 35.33	1	0.28											
WS	2.55																										
RC	RC7466 - 7469 2.55		100	1.52		21.1																					
WS	2.55																										
160F	RC7469 - 7474 4.20		52.2	1.46		22.1																					
CCC	RC7469 - 7474 4.20		100	1.73		41.7																					
WS	4.20																										
160F	RC7480 - 7481 2.06		68.6	1.43		18.2																					
WS	2.06																										
RC	RC7480 - 7481 2.06		100	1.61		30.6																					
WS	2.06																										

GSQ Record 1980/50

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Lenton Downs
Grosvenor NS 6 and 3



Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
WS	RC6675 1.37	GSQ Record 1979/35	100	1.52		19.7																					
WS	RC6581 1.42		100	1.76		48.8																					
160F	RC6581		100	1.47		25.0																					
TS	RC6585 2.01		100	1.59	2.7	30.3 db 31.1	23.6 daf 35.4	43.4 daf 64.3						23.38 db 24.00		0.42 db 0.43											
160F	RC6585 2.01		72.5	1.33	2.2	14.7 db 15.0	26.5 daf 31.1	54.6 daf 68.1						29.76 db 30.43		0.34 db 0.35											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Lenton Downs
Grosvenor NS 6 and 3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Kemmis Creek
Kemmis Creek Trial Shaft No 2 and NS 9

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Kemmis Creek
Kemmis Creek Trial Shaft No 2 and NS 9

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth	Vit % mmf	Section	Thickness	Source
← Rangal Coal Measures →					
? Elphinstone seam	32.41	T51 32		5.80	CSIRO LR201
	38.41				
	42.67				
Hynds seam		K59 39		2.61	QGMJ Jan.1974
	45.28				

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
tcc'	LN6586 5.80	CSIRO LR201	100	19	23 maxi 23	67	1
				19	23	58	

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
tcc'	RC2682 2.17 PS465	QGMJ Jan.1974	~82	32	50	18
				34	mod 61	

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
tcc'	LN6586 5.80	CSIRO LR201	100	1.42
tcc'	RC2682 2.17	QGMJ Jan.1974	~82	1.63

PROXIMATE wt % ad

M	A	VM	FC
1.5	12.7 db 12.9	17.9 def 20.8	67.9 def 79.2
2.5	35.7 db 36.6	13.7 def 23.2	48.1 def 77.8

ULTIMATE wt % ad

C	H	O	N	S
76.6	4.1	3.7	1.3	0.1
89.1	4.8	4.4	1.5	0.2

SE MJ/kg	CSN
30.56 daf 35.61	1½
	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.29 dis 0.34	0.11	0.18	0.061		0.01	<1	0.15
0.30 dis 0.48							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Annandale
Grosvenor NS 8

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Annandale
Grosvenor NS 8

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth	Vit % mmf	Section	Thickness	Source
← Rangal Coal Measures →					
(Elphinstone) seam	125.71			1.51	GSQ Record 1974/35
	127.22				
	135.18			2.17	
	137.35				
	139.04			1.57	
Poitrel Upper? or Middle? seam	169.61				
	175.64			2.68	
	178.32				
(Hynds) seam	219.76				
	222.78				
	240.66				
	242.54				
	279.83				
← Fort Cooper Coal Measures → Fort Cooper sedn	285.46				

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
'ws'	RC6699 + RC6940	GSQ Record 1974/35	~96	1.75
1 50F	"		27.2	1.42
1 60F	" 1.51		37.3	1.46
'ws'	RC6991-93		100	1.68
1 50F	"		41.6	1.43
1 60F	" 2.21		57.1	1.48
'ws'	RC6994-96		~96	1.62
1 50F	"		62.6	1.43
1 60F	" 1.57		73.2	1.44
'ws'	RC6996-98		100	1.44
1 50F	"		85.5	1.37
1 60F	" 2.68		89.7	1.38

PROXIMATE wt % ad

M	A	VM	FC
	38.5		
	13.6		
	18.0		
	35.2		
	15.3		
	19.1		
	16.4		
1.5	16.8 db 17.1	16.7 def 20.9	65.0 def 79.6
	15.5 db 15.7	17.0 def 20.6	66.2 def 79.8
1.2	9.4 db 9.5	17.8 def 19.3	72.2 def 90.7
	10.5		

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
29.98 daf 35.85	
29.98 daf 35.43	
32.45 daf 35.92	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.38 dis 0.48							
0.38 dis 0.40							
0.30 dis 0.40							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Kemmis Creek
Wodehouse NS 2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Kemmis Creek
Wodehouse NS 2

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth	Vit % mmf	Section	Thickness	Source
← Rangal Coal Measures →					
Elphinstone seam	60.10			1.12	GSQ Record 1976/6
	65.86			0.81	
	126.81				
Hynds seam				2.24	
	129.11				
← Fort Cooper Coal Measures → Fort Cooper sedn	ml + mJ lustroids				

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
a	RC6723 1.12	GSQ Record 1976/6	100	1.43
a-b	RC6723 - 6725 1.93		100	1.41
b	RC6725 0.81		100	1.39
ms	RC6711 - 6713 2.24			1.48
1 50F	RC6711 - 6713 2.24			1.40

PROXIMATE wt % ad

M	A	VM	FC
1.5	15.2 db 15.4	17.5 def 21.1	65.8 def 78.9
1.5	14.7 db 14.9	17.4 def 20.7	66.4 def 79.3
1.5	14.0 db 14.2	17.1 def 20.1	67.4 def 79.9
1.5	21.0 db 21.3	15.9 def 20.5	61.5 def 79.5
1.5	14.3 db 14.5	16.0 def 19.0	68.2 def 81.0

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
29.50 daf 33.65	5½
29.94 daf 33.71	
30.44 daf 35.81	+
27.37 daf 35.27	
30.13 daf 35.74	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2

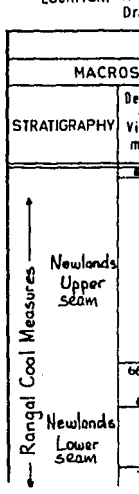
ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Newlands
Drake NS 16



PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

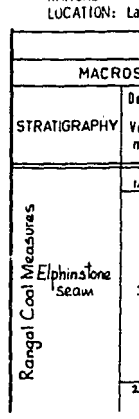
MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
WS'	RC6677 – 6685 6·73	GSQ Record 1976/7	100	1·52	2·5	19·4 db 19·9	25·1 daf 32·1	53·2 daf 67·9						25·98 daf 32·54		0·28 daf 0·36								43·4 1·4	31·6 1·1		
160F	RC6677 – 6685 6·73			1·43	2·5	14·1 db 14·4	26 daf 31·3	57·3 daf 48·7						27·97 daf 33·54		0·28 daf 0·34											
WS'	RC6706 2·21		100	1·53	2·5	23·0 db 25·6	26·0 daf 34·9	48·5 daf 65·3						24·38 daf 32·51		0·31 daf 0·41			0·08					46·5 2·0	23·8 1·1		
160F	RC6706 2·21		77·6	1·43	2·6	16·6 db 17·0	26·3 daf 32·5	54·5 daf 67·5						27·96 daf 34·03	1·4	0·37 daf 0·46											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Lake Elphinstone NS 7 R



PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - WT %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

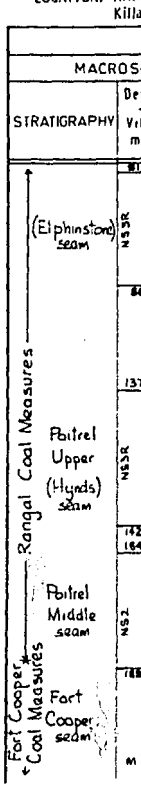
MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc'	PS436 6·96	QGMJ April 1974	85			27	59	14																			
						31	69																				
				1·37																							
ccc'	RC2543 6·96	QGMJ April 1974	85	1·41	1·7	14·0 db 14·2	18·2 daf 20·6	66·1 daf 74·4						29·96 daf 35·08		0·25 daf 0·30			0·074					45·0 1·15	31·0 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Annandale
Killarney 2 and 3 R



PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

MINOR wt % ad: S (TS; P+S; O); P; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc'	RC6885-89	GSQ Record 1974/35	100	1·54		20·9									½											
150F	"		74·2	1·42	1·8	13·0 db 13·2	15·1 daf 15·3	72·1 daf 84·7						30·39 daf 35·67	½	0·36 daf 0·42										
160F	" 4·34		85·0	1·43		13·4									½											
ccc'	RC6895-96 +6898-99		98	1·52		16·8									½											
150F	"		82·2	1·39	1·8	9·4 db 9·6	13·0 daf 14·6	75·8 daf 85·4						31·75 daf 35·75	½	0·40 daf 0·45										
160F	" 4·70		84·7	1·40		9·3									½											
'ss'	RC6880-88															0·38										
ccc'	RC6880-84		100	1·54		25·0									½											
150F	"		65·4	1·42	1·6	15·8 db 16·0	11·5 daf 13·9	71·1 daf 86·1						24·54 daf 29·71	½	0·41 daf 0·49										
160F	" 3·52		78·8	1·45		16·3										0·43										
'ls'	RC6882-84																									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Poitrel
Poitrel NS 21 R

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal C M — Poitrel Upper seam	37.77 / 42 / 42.86		5.11	QGMJ Jan 1973

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ccc	PS550-66	QGMJ Jan 1973	99	36 / 42 mmf	50 / 58	14

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD

PROXIMATE wt % ad: M | A | VM | FC

ULTIMATE wt % ad: C | H | O | N | S

SE MJ/kg | CSN

MINOR wt % ad: S (TS | P+S | O) | P | F | Cl | As ppm | CO_2

ASH: SiO_2 % | Al_2O_3 %

TRACE: B ppm ad | Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Poitrel
Poitrel NS 19 R

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal C.M. — Poitrel Upper seam	66.92 / 37 / 71.96		5.04	QGMJ Jan 1973

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
WS	PS536-44	QGMJ Jan 1973		30 / 37 mmf	52 / 63	18
	5.00					

REFLECTANCE

Sample type	Sample Number	Source	R_o max
QMS1		QGMJ Jan 1973	1.85

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
WS	RC3603	QGMJ Jan 1973	96	1.44
	5.00			1.44
	5.00			

PROXIMATE wt % ad: M | A | VM | FC

M	A	VM	FC
1.3	18.0 db / 18.2	21.7 daf / 26.4	59.0 daf / 73.1
1.5	14.9 db / 15.1	20.2 daf / 24.5	63.0 daf / 75.5

ULTIMATE wt % ad: C | H | O | N | S

SE MJ/kg | CSN

SE MJ/kg	CSN
29.24 daf / 34.98	1

MINOR wt % ad: S (TS | P+S | O) | P | F | Cl | As ppm | CO_2

TS	P+S	O	P	F	Cl	As ppm	CO_2
0.26 daf / 0.32							
0.34 daf / 0.38			0.043				

ASH: SiO_2 % | Al_2O_3 %

SiO_2 %	Al_2O_3 %
53.4	29.7
1.8	1

TRACE: B ppm ad | Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: St Albans
St Albans NS 25

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures — Walker Creek Main seam	65.92 / 41 / 65.45		7.49	QGMJ Oct. 1973

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ccc	PS584	QGMJ Oct. 1973	95	34 / 41 mmf	51 / 59	13
	1.35					

REFLECTANCE

Sample type	Sample Number	Source	R_o max
QMS		QGMJ Oct 1973	1.78

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	RC3795	QGMJ Oct 1973	96	1.44
	1.35			

PROXIMATE wt % ad: M | A | VM | FC

M	A	VM	FC
1.0	14.3 db / 14.4	15.3 daf / 17.6	69.4 daf / 82.4

ULTIMATE wt % ad: C | H | O | N | S

SE MJ/kg | CSN

SE MJ/kg	CSN
30.05 daf / 34.90	1.2

MINOR wt % ad: S (TS | P+S | O) | P | F | Cl | As ppm | CO_2

TS	P+S	O	P	F	Cl	As ppm	CO_2
0.29 daf / 0.34							
0.31			0.014		0.09		

ASH: SiO_2 % | Al_2O_3 %

SiO_2 %	Al_2O_3 %
4.17	2.99
1.4	1

TRACE: B ppm ad | Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Annandale
Grosvenor NS 10

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures — Poitrel Upper seam	236.03 / 241.22 / 277.56		5.19	GSQ Record 1974/35
Rangal Coal Measures — Poitrel Middle seam	284.84 / 303.68 / 364.52 / 554.10		1.33 / 1.08 / 1.40 / .64 / 1.38 / 2.49	GSQ Record 1974/35
Fort Cooper Coal Measures — Fort Cooper seam	341.12		1.42 / 1.34	GSQ Record 1974/35

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
WS	RC7055-59	GSQ Record 1974/35	100	1.41
1 SOF	RC7055-59		91.0	1.36
1 60F	RC7055-59 5.19		93.8	1.37
WS	RC7103-06		92	1.50
1 50F	RC7103-06		68.0	1.36
1 60F	RC7103-06 4.01		79.3	1.39
WS	RC7108-16		85	1.65
1 SOF	RC7108-16		40.6	1.41
1 60F	RC7108-16 6.58		58.5	1.46

PROXIMATE wt % ad: M | A | VM | FC

M	A	VM	FC
1.7	11.7 db / 11.9	20.6 daf / 23.8	66.0 daf / 76.2
1.6	7.3 db / 7.4	20.6 daf / 31.7	70.5 daf / 68.3
	8.7		
	23.9		
	13.2		
	15.6		
	35.1		
	15.8		
	20.5		

ULTIMATE wt % ad: C | H | O | N | S

SE MJ/kg | CSN

SE MJ/kg	CSN
30.61 daf / 35.23	
31.57 daf / 35.75	

MINOR wt % ad: S (TS | P+S | O) | P | F | Cl | As ppm | CO_2

TS	P+S	O	P	F	Cl	As ppm	CO_2
0.22 daf / 0.27							
0.21 daf / 0.25							

ASH: SiO_2 % | Al_2O_3 %

TRACE: B ppm ad | Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Picardy
Cairns County NS 14

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Picardy
Cairns County NS 14

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: Rangal Coal Measures; Middlemount seam; Pisces seam

Depth in Virt. mmf	Section	Thickness	Source
249.58			
		5.01	GSQ Record 1975/30
254.59			
304.47			
311.52			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max
Sub.	25143	GSQ Record 1975/30	1.89

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
cs	RC7696 - 7699 6.01	GSQ Record 1975/30	100	

PROXIMATE wt % ad

M	A	VM	FC
2.2	16.8 db 17.2	14.1 daf 17.4	66.9 daf 82.6

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
27.86 daf 34.40	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.33 daf 0.41			0.089	0.015	0.08		

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Roper Creek East
Cairns County NS 8

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Roper Creek East
Cairns County NS 8

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: Rangal Coal Measures; Middlemount seam; Pisces seam; Burngrove Fm; Girrah seam

Depth in Virt. mmf	Section	Thickness	Source
65.78			
		5.03	GSQ Record 1974/38
70.76			
102.21			
		4.96	
106.27			
220.16			
		2.59	GSQ Record 1974/38
222.75			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ms	RC 7517 5.03	GSQ Record 1974/38		
ws	RC7518 4.96			
140	RC7518 4.96		65.7	
140	RC7518 4.96		34.3	
145	RC7519 2.59			

PROXIMATE wt % ad

M	A	VM	FC
2.0	10.9 db 11.1	17.4 daf 20.0	69.7 daf 80.0
1.8	14.0 db 14.3	18.0 daf 21.4	66.2 daf 78.6
1.6	11.1 db 11.8	16.3 daf 20.2	72.4 daf 89.8
2.0	16.0 db 26.5	17.5 daf 24.3	54.5 daf 75.6
4.2	10.3 db 10.4	17.7 daf 20.0	70.8 daf 80.0

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
30.84 daf 39.41	
29.77 daf 35.44	
32.68 daf 38.90	4.5
24.62 daf 34.19	
32.19 daf 36.32	8 ½

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.80 daf 0.96			0.067	0.001	0.10		
0.47 daf 0.56			0.012	0.001	0.05		
0.08 daf 0.09			0.009	0.001	0.04		
0.40 daf 0.48			0.06	0.001	0.08		
0.86 daf 0.93			0.036	0.001	0.04		

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Roper Creek East
Cairns County NS 5

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Roper Creek East
Cairns County NS 5

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: Rangal Coal Measures; Middlemount seam; Pisces seam

Depth in Virt. mmf	Section	Thickness	Source
285.47			
		5.86	GSQ Record 1974/38
291.33			
355.99			
		2.05	GSQ Record 1974/38
357.98			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ws	RC7200 - 7205 6.86	GSQ Record 1974/38		1.40
	RC7206 - 7208 2.05			1.41

PROXIMATE wt % ad

M	A	VM	FC
1.3	12.2 db 12.4	13.5 daf 15.4	73.2 daf 84.6
1.5	14.4 db 14.6	12.5 daf 14.9	71.6 daf 85.1

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
30.76 daf 35.56	½
30.32 daf 36.05	½

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.34 daf 0.39							
0.36 daf 0.43							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Roper Creek East
Roper NS 1 and 2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Roper Creek East
Roper NS 1 and 2

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	226.47			GSQ Record 1974/38
Middlemount seam	NS1		3.07	
	229.54			
	273.79			
Pisces seam	NS1		5.35	
	279.14			
	195.20			
	NS2		2.59	
	197.79			
Girrah seam				
Burngrove Formation	206.73			
	NS1		2.46	
	209.19			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
ws'	RC 7594 3.07	GSQ Record 1974/38		
ws'	RC 7595 5.35			
1.40s	RC 7595 5.35		69	
1.40s	RC 7595 5.35		38.1	
1.66s	RC 7732 2.59			

PROXIMATE wt % ad

M	A	VM	FC
2.2	11.8 db 12.1	18.6 dcf 21.4	67.4 dcf 78.6
1.8	16.5 db 16.8	18.1 dcf 22.1	63.6 dcf 77.9
1.6	7.2 db 7.3	19.9 dcf 20.8	72.2 dcf 79.3
2.0	31.8 db 32.4	16.5 dcf 25.0	49.7 dcf 75.3
1.9	15.4 db 15.6	19.7 dcf 22.3	64.5 dcf 77.7

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
29.85 daf 34.71	
28.77 daf 35.02	
32.79 daf 36.03	6
22.1 daf 35.50	
29.93 daf 36.03	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.31 daf 0.34			0.012	0.010	0.11		
0.32 daf 0.34			0.013	0.022	0.08		
0.36 daf 0.37			0.012	0.015	0.08		
0.28 daf 0.42			0.046	0.053	0.06		
0.38 daf 0.47			0.011	0.007	0.08		

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Girrah
Blackwater NS 163

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Girrah
Blackwater NS 163

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	91.46			GSQ Records 1973/23 and 1980/12
Middlemount Upper (Aries) seam			3.36	
	94.82			
	137.01			
Trakee (Mackenzie) seam			2.48	
			3.10	
	142.94			
	241.33			
			1.57	
	243.36			
	245.79			
Burngrove Formation	Virgo + Libra? + Leo? seam		2.34	
	248.34			
	252.73			
			1.36	
	254.45			
	256.54			
			1.85	
	260.14			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD
ws'	RC6384 - 6385 3.36	GSQ Records 1973/23 and 1980/12	100	1.42
us	RC6386 - 6387 2.48		100	1.40
ls'	RC6388 - 6389 3.10		100	1.38
ls'	RC 6391 1.57		100	1.47
ms'	RC 6393 2.34		93.5	1.54
us'	RC6394 1.55		87.7	1.60
ms'	RC 6395 0.91		80.9	1.57
ls'	RC 6396 0.46		100	1.67
ws'	RC 6397 1.85		98.0	1.67

PROXIMATE wt % ad

M	A	VM	FC
1.3	12.4 db 12.6	18.0 dcf 21.4	68.3 dcf 78.6
1.3	11.7 db 11.9	17.5 dcf 20.1	69.5 dcf 79.9
1.4	11.6 db 11.8	19.5 dcf 21.3	69.5 dcf 78.7
1.3	21.4 db 21.7	14.3 dcf 18.5	63.0 dcf 81.5
1.6	27.8 db 28.2	13.2 dcf 18.7	57.4 dcf 81.3
1.9	31.3 db 31.7	4.4 dcf 21.4	52.9 dcf 78.6
1.7	21.6 db 21.9	12.9 dcf 19.3	53.8 dcf 80.7
1.9	11.6 db 11.9	9.4 dcf 19.8	67.4 dcf 80.2

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
30.49 daf 35.33	
30.80 daf 36.40	
31.08 daf 35.72	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.44 daf 0.79			0.005				
0.97 daf 0.65			0.053				
1.00 daf 1.15			0.047				

5%
2%
2%
3
2
2%

ASH

SiO_2 %	Al_2O_3 %
38.3 1.3	30.5 1
45.4 1.6	28.0 1
37.0 1.9	21.0 1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Yarrabee
Minad TMC 102

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures — A seam				
B-C seam				
Main seam	29.65 / 46 / 33.49		3.84	QGMJ Feb 1969 / CSIRO LR366 / QGMJ Feb 1969
F seam				
Y seam				
G seam				

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ws	LN23612		83	35	19 mod	42	4
ccc	3.84			36	20	44	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
ws	LN23612	CSIRO LR366	83	1.43	1.8	6.8 db 9.0	9.2 daf 10.3	80.2 daf 89.7	81.9	3.2 daf 3.6	2.1 daf 2.3	1.6 1.8	0.6 0.6	31.28 daf 35.01	0
ccc	3.84								91.7						

MINOR wt % ad

Sample type	TS	S P+S	S O	P	F	Cl	As ppm	CO_2
ws	0.55	0.00 daf	0.55	0.083		0.14	<1	0.04
ccc	0.62	0.00	0.62					

ASH

Sample type	SiO_2 %	Al_2O_3 %
ws	55.1	29.0
ccc	19	1

TRACE

Sample type	B ppm ad	Ga ppm ad
ws	4	25

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Bluff
Minad Boreholes B98, B99 and B100

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures — Excel A=No1 seam	51		1.91	Minad B100
Windsor B=No2 seam				CSIRO LR365
C=No3 seam				
Cambria D=No4 seam	61		3.00	Minad B99
E=No5 seam				
Bluff F=No6 seam	60		1.40	Minad B98
G=No7 seam				
Burngrove Formation — H=No8 seam				MINAD CR2724
I seam				
J seam				
composite section				

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc	23.097 2.70	CSIRO LR365	73	32 36	23 25	35 39	10
ccc ws	23.068 1.40		87	44 49	20 daf 22	26 29	10

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
ccc ws	23.057 1.51	CSIRO LR365	83	~1.55	1.4	8.8 db 9.0	15.6 daf 17.2	74.1 daf 82.6	80.5 88.6	4.0 daf 4.5	3.1 3.4	1.8 2.0	0.5 0.5	32.47 daf 36.19	6½
145F	Hole 516 1.78		87.3		1.2	7.2 db 7.3	13.8 daf 15.0	77.8 daf 84.6							3½
145F	Hole 533 0.99		93.5		1.6	9.5 db 9.6	16.5 daf 18.5	72.4 daf 81.4							6½
145F	Hole 555 1.22		82.4		2.4	9.1 db 8.5	14.9 daf 16.4	73.7 daf 83.0							5
ccc	23.097 2.70		73	~1.4	1.3	14.1 db 14.3	14.4 daf 17.0	70.2 daf 83.0	75.4 89.0	3.7 daf 4.4	3.4 daf 4.0	1.7 2.1	0.4 0.5	30.098 daf 36.57	1¾
145P	Hole 540 2.70		64.0		1.2	9.6 db 9.7	14.6 daf 16.2	75.6 daf 84.0							4
ccc ws	23.068 1.40		87	~1.4	1.9	13.8 db 14.1	14.0 daf 16.6	70.3 daf 83.4	75.2 89.3	3.6 daf 4.3	3.2 daf 3.7	1.8 2.1	0.5 0.6	30.15 daf 34.77	1½
145P	Hole 541 3.42		80.4		1.1	6.5 db 6.6	14.3 daf 15.5	78.1 daf 84.5							7
145P	Hole 536 1.60		61.9		2.0	8.7 db 8.9	13.7 daf 15.4	75.6 daf 84.6							1½
145P in MINAD CR 2724															

MINOR wt % ad

Sample type	TS	S P+S	S O	P	F	Cl	As ppm	CO_2
ccc ws	0.44 1.06	0.45 daf 0.52	0.49 0.54	0.12		0.10	<1	0.12
145F	0.52 daf 0.57			0.068				
145F								
145F								
ccc	0.89 1.01	0.47 daf 0.52	0.42 0.44	0.12		0.16	1	0.29
145P	0.6 daf 0.73							
ccc ws	0.91 1.08	0.40 daf 0.41	0.51 0.61	0.50		0.10	2	0.44
145P	0.78 daf 0.84							
145P								

ASH

Sample type	SiO_2 %	Al_2O_3 %
ccc	56.6	27.1
ccc ws	65.2 32	17.0 1

TRACE

Sample type	B ppm ad	Ga ppm ad
ccc	4	4
ccc ws	4	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 100

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures — Taurus (Main Lower) seam	29.44 / (us+23) / 41 / (ls+60) / 36.55 / 36.55		7.11	CSIRO LR372

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc	LN26173 6.93	CSIRO LR372	~80	28 30	21 21	46 49	6

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
ccc	LN26173 6.93	CSIRO LR372	~80	1.37	2.1	10.5 db 10.7	24.0 daf 27.4	63.4 daf 72.6	75.8 86.7	4.2 4.8	5.4 daf 6.3	1.8 2.0	0.2 0.1	30.56 daf 34.96	1

MINOR wt % ad

Sample type	TS	S P+S	S O	P	F	Cl	As ppm	CO_2
ccc	0.27 0.31	0.07 daf 0.08	0.20 0.23	0.022 (ls+ 0.005)		0.06	0	0.52
(ws+ 0.016)								

ASH

Sample type	SiO_2 %	Al_2O_3 %
ccc	67.4 23	25.0 1

TRACE

Sample type	B ppm ad	Ga ppm ad
ccc	10	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Jellinbah
Blackwater NS 9 , 11 R and 173

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Jellinbah
Blackwater NS 9 , 11 R and 173

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth — Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	35·55			
Cancer seam	34·20			
	62·55			
Mammoth seam	NS9		2·97	GSQ Records 1973/15 and 1977/10
	65·52			
	117·44			
Pollux seam	NS11R		2·73	
	130·17			
	145·52			
Pisces seam	NS9		1·67	
	147·19			
	52·30			
Virgo seam	NS173		5·18	
	57·48			
	92·71			
Libra seam	NS173			
	96·48			
	106·25		0·99	
Leo seam				
	107·24			
	134·90			
Aquarius seam	NS173			
	134·01			
	192·96			
Scorpio seam			1·24	
	194·20			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+Dl+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
WJ6	RC1425 2·97	GSQ Records 1973/15 and 1977/10	96·6	1·49	1·6	29·6 db 20·9	18·9 daf 24·3	58·9 daf 75·7						27·39 daf 35·14	1	0·40 daf 0·51											
160P	RC1425 2·97			1·50	1·4	16·2 db 16·4	16·5 daf 20·0	65·9 daf 83·0						29·87 daf 36·24	2½	0·36 daf 0·44											
WJ5	RC1646 2·73			1·00	1·42	1·4	17·1 db 17·3	18·0 daf 22·1	63·5 daf 77·4						2	0·28 daf 0·34											
160R	RC1646 2·73			1·20	1·2	6·1 db 5·2	11·9 daf 12·7	81·8 daf 87·3							8	0·44 daf 0·47											
WJ5	RC1427 1·67			1·03	1·47	1·8	20·0	17·6	60·6					27·28 daf 34·89	1½	0·33 daf 0·42											
160R	RC1427 1·67			1·52	1·5	20·4 16·8 db 17·0	22·5 16·1 daf 19·7	77·5 65·6 daf 80·3						29·89 daf 36·58	2½	0·30 daf 0·37											
WJ5	RC6559 – 6562 5·18		98·4	1·75	2·3	45·5 db 46·6	10·6 daf 20·4	41·3 daf 79·6						13·46 daf 25·93	½	0·63 daf 1·21											
WJ8	RC6563 0·99		100	1·68	1·3	37·6 db 38·1	13·5 daf 22·1	47·6 daf 77·9						20·72 daf 33·92	1	0·66 daf 1·08											
WJ8	RC6564 1·24		91·5	1·75	1·6	43·9 db 44·6	11·6 daf 21·3	42·9 daf 78·7						18·40 daf 33·76	½	0·36 daf 0·66											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Picardy
Cairns County NS 23

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Picardy
Cairns County NS 23

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth — Vit % mmf	Section	Thickness	Source
Rangal C.M.	348·09			
Middlemount seam			5·10	GSQ Record 1975/130
	353·19			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+Dl+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max
Sub	RC 7895 351·97 353·19	GSQ Record 1975/130	1·72

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
WS1	RC7922 5·10	GSQ Record 1975/130	99		1·8	14·4 db 14·7	14·3 daf 17·0	69·5 daf 83·0						29·35 daf 34·94					0·040	0·011	0·10					
WS1	RC7944 6·32	GSQ Record 1975/130	94·6		2·1	10·4 10·6	16·2 16·8	71·3 daf 81·6						30·87 daf 35·08		0·34 daf 0·54			0·059	0·012							

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Picardy
Cairns County NS 24

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Picardy
Cairns County NS 24

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth — Vit % mmf	Section	Thickness	Source
Rangal C.M.	167·10			
Middlemount seam			6·32	GSQ Record 1975/130
	173·42			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+Dl+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max
Sub	173·16	GSQ Record 1975/130	1·47

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
WS1	RC7944 6·32	GSQ Record 1975/130	94·6		2·1	10·4 10·6	16·2 16·8	71·3 daf 81·6						30·87 daf 35·08		0·34 daf 0·54			0·059	0·012							

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 85

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Burngrove Formation — Rangal Coal Measures — Aries seam	172.21		1.73	GSQ Record 1977/10
	173.94			
Castor seam	191.92		1.32	
	193.24			
Pollux seam	204.85		2.74	
Orion seam	207.84			
Pisces seam	249.40		1.77	
Virgo seam	251.17		1.35	
	275.74			
	277.09			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
'WS'	RC5143 1.32						
'WS'	RC5146 2.74						
'WS'	RC5147 1.77						
'S'	RC5144 1.35						

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
'WS'	RC5143 1.32					
'WS'	RC5146 2.74					
'WS'	RC5147 1.77					
'S'	RC5144 1.35					

REFLECTANCE

Sample type	Sample Number	Source	R_o max
'WS'	RC5143 1.32		
'WS'	RC5146 2.74		
'WS'	RC5147 1.77		
'S'	RC5144 1.35		

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'WS'	1.73	GSQ Record 1977/10	100	1.40	2.0	11.8 db 12.0	20.4 daf 23.7	65.8 76.3						30.44 daf 35.40	3	0.34 daf 0.38											
'S'	RC5143 1.32		100	1.61	3.1	33.7 db 33.7	17.0 daf 26.5	47.2 73.5																56.2 23	24.7 1		
'WS'	RC5146 2.74		100	1.44	2.3	16.0 db 16.4	21.7 daf 26.6	60.0 73.4						28.86 daf 35.33	4	0.42 daf 0.51			0.11	0.24		6.5		48.4 20	23.7 1		
'WS'	RC5146		86.3	1.36	2.0	8.5 db 8.8	22.7 daf 24.8	67.3 75.2							5												
'WS'			11.4		2.2	20.7 db 21.2	18.9 daf 24.5	58.2 75.5						26.60 daf 34.44					0.066					47.7 2.1	22.5 1		
'WS'	RC5147 1.77		100	1.42	2.0	19.9 db 20.3	14.4 daf 24.8	58.7 75.2						28.01 daf 35.40					0.14	0.11		2.6	60.3	20.1 3.0	1	
'S'	RC5144 1.35		100	1.58	2.4	31.6 db 32.4	18.5 daf 28.0	47.5 72.0							8.4				0.017	0.25		2.8	53.0	25.1 2.3	1	

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Minyango East
Blackwater 116

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Burngrove Formation — Rangal Coal Measures — Aries seam	182.22		2.83	GSQ Record 1975/8
	185.05			
Castor seam	201.84		1.03	
	208.37			
Pollux seam	210.69		2.48	
Orion seam	221.17		1.80	
Pisces seam	284.61			
Virgo seam	286.41			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
'WS'	RC4584-4586 2.48						
'S'	RC4587 1.80						

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
'WS'	RC4584-4586 2.48					
'S'	RC4587 1.80					

REFLECTANCE

Sample type	Sample Number	Source	R_o max
'WS'	RC4584-4586 2.48		
'S'	RC4587 1.80		

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'CCC' 'WS'	RC4583 2.83	GSQ Record 1975/8	100	1.37	0.5	11.0 db 11.1	22.3 daf 28.5	66.2 71.7						30.65 daf 34.48	3.4	0.32 daf 0.36			0.082	0.34		1.26		45.8 1.9	24.3 1		
'WS'	RC4584-4586 2.48		100	1.36	2.6	11.4 db 11.7	21.4 daf 29.9	64.6 75.1							1	0.37 daf 0.43											
'CCC' 'WS'	RC4587 1.80		100	1.41	1.1	16.7 16.9	20.6 daf 25.1	61.6 74.9						28.44 daf 34.60	8	0.31 daf 0.38			0.230	0.09		2.14	56.5 4.3	13.0 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BURNGROVE FORMATION
LOCATION: Broadmeadow NS 14

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Burngrove Fm	70.13		5.08	QGMJ Sept 1974
	75.20			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
'CCC'	PB532 5.08	QGMJ Sept 1974	97	16	41 31	41	41

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
'CCC'	PB532 5.08	QGMJ Sept 1974	97	16	41 31	41

REFLECTANCE

Sample type	Sample Number	Source	R_o max
'CCC'	PB532 5.08	QGMJ Sept 1974	1.23

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	F	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
'CCC'	RC5031 5.08	QGMJ Sept 1974	97	1.66	1.6	40.0 db 46.6	16.8 daf 28.1	41.6 71.3						20.10 daf 33.50	1.2	0.76 daf 1.31											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Sirius Creek
Borehole ODDH 5 (Clutha)

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Sirius Creek
Borehole ODDH 5 (Clutha)

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
← Rangal C.M. → Taurus seam	218-59 / 57 / 225-28		4·66	CSIRO IR222R

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc'	LN23868	CSIRO IR222R	90	37	27 mmf	23	3
us'	4·67			38	28	24	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ccc'	LN23888	CSIRO IR222R	90	56 mmf	43	1
us'	4·67			57	43	

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc'	LN23888	CSIRO IR222R	90	1·34
us'	4·67			

PROXIMATE wt % ad

M	A	VM	FC
1·9	7·7 db 7·8	27·8 daf 30·8	62·6 64·2
			86·8

ULTIMATE wt % ad

C	H	O	N	S
78·5	4·7	4·9 daf 5·4	2·0 2·2	0·3 0·4

SE MJ/kg	CSN
30·83 daf 34·12	6½

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·22 daf 0·36	0·05 daf 0·08	0·27 0·30	0·038		0·02	<1	0·42

ASH

SiO_2 %	Al_2O_3 %
49·3 1·4	35·6 1

TRACE

B ppm ad	Ga ppm ad
4	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Sirius Creek
No 1 Mine

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Sirius Creek
No 1 Mine

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
← Rangal C.M. → Taurus	52		4·00	CSIRO IR275R

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc'	LN24682 bulk sample	CSIRO IR275R	100	35	26 mmf	31	8
us'				38	28	34	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc'	LN24679	CSIRO IR275R	100	1·37
us'	4·00 LN24701 working sections			

PROXIMATE wt % ad

M	A	VM	FC
1·3	9·9 db 10·0	28·6 daf 27·7	64·2 72·3
			81·1

ULTIMATE wt % ad

C	H	O	N	S
77·3	4·4	4·9 daf 5·6	1·9 2·1	0·3 0·3

SE MJ/kg	CSN
30·16 daf 33·97	6

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·36 daf 0·40	0·08 daf 0·09	0·28 0·31	0·079		0·02	<1	0·89

ASH

SiO_2 %	Al_2O_3 %
46·8 1·5	30·2 1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 97

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 97

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures Taurus seam	34·97 / us'·25 / ccc' 37 / 7·75 / 14'·55 / 42·72		7·75	CSIRO LR 374

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc'	LN26301			24	23 mmf	49	5
	7·75			25	24	51	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
		CSIRO LR374		

PROXIMATE wt % ad

M	A	VM	FC

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
		us'~0·150					
		14'~0·050					

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Utah Bore 216

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Utah Bore 216

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures Taurus seam	31·34 / 33 / 27 / 41 / 59 / 70 / 34·46		8·12	CSIRO LR 328

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
A-S	LN16808 1·52	CSIRO LR 328	37	16	18 mmf 18	67	tr
G-V	LN16809 3·05		76	16	22 mmf 22	62	tr
ccc'	LN16812 8·07			28	33 mmf 33	39	tr
M-66	LN16810 3·05		~76	41	26 mmf 26	32	1
HH-88	LN16811 0·72		45	56 mmf 58	22 mmf 23	19	3

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
A-S	LN16806 1·52	CSIRO LR 328	37	1·7
G-V	LN16809 3·05		76	2·6
ccc'	LN16812 8·07			2·5
M-66	LN16810 3·05		~75	2·6
HH-88	LN16811 0·72		45	2·4

PROXIMATE wt % ad

M	A	VM	FC
1·7	11·1 db 11·4		
2·6	9·2 db 9·4		
2·5	4·5 db 9·7	24·1 daf 27·3	66·0 72·7
2·6	9·4 db 9·6		
2·4	8·8 db 9·0		

ULTIMATE wt % ad

C	H	O	N	S
76·2	4·8	5·6 daf 6·3	1·7 1·9	0·6 0·4
86·4	4·8			

SE MJ/kg	CSN
30·84 daf 35·03	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0·32 0·57	0·09 daf 0·10	0·13 0·27	0·14		0·05	1	0·04
0·81 0·47	0·18 daf 0·21	0·26 0·26	0·15		0·10	1	0·08
0·37 0·42	0·15 daf 0·17	0·22 0·25	0·060		0·10	1	0·12
0·34 0·39	0·08 daf 0·09	0·26 0·30	0·001		0·09		0·17
0·62 0·98	0·13 daf 0·21	0·23 0·37	0·005		0·08		0·05

ASH

SiO_2 %	Al_2O_3 %
55·2 1·9	29·7 1
62·8 18	30·0 1
55·2 1·9	30·4 1
57·6 1·9	30·4 1
61·9 2·5	29·1 1

TRACE

B ppm ad	Ga ppm ad
20	7
20	5
25	6
30	6
20	8

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 86

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 86

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures Taurus seam	40·36 / 42 / 47·94		7·58	CSIRO LR 377

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc'	LN24941 6·42	CSIRO LR 377	~86	30	24 mmf 25	42	4
				31		44	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
		CSIRO LR377		
ccc'	LN24938 0·45			

PROXIMATE wt % ad

M	A	VM	FC

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
			0·32				

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Togara NS 14

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: ← Rangal Coal Measures →
Aries I seam — 111.56
Aries II seam — 113.95 / 151.87
Upper Pollux seam — 133.61 / 140.56
Lower Pollux seam — 142.27
Depth – Vit %, mmf
Section
Thickness: 2.39; 1.80; 1.70
Source: GSQ Record 1978/14.

MICROLITHOTYPE - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+C | Vt+CD+DC | I | SC+MM

MACERAL - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+E | I | MM

REFLECTANCE
Sample type | Sample Number | Source | R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ws	RC7159 – 7160 2.39	GSQ Record 1978/14	141		5.2	11.4 db 12.0	26.8 daf 32.3	56.6 daf 68.2						27.55 daf 33.20		0.33 daf 0.40			0.008					34.8 36	15.4 1		
ws	RC7161 – 7162 1.80	GSQ Record 1978/14	100	145	5.3	16.6 db 16.5	25.7 daf 32.5	53.4 daf 47.6						25.80 daf 32.10	-1	0.34 daf 0.43			0.022					55.0 40	13.7 1		
ws	RC7373 – 1.70	GSQ Record 1978/14	100	162	5.8	11.7 db 12.4	28.8 daf 35.1	59.7 daf 65.5						28.05 daf 34.2	-1	0.40 daf 0.48			0.026					55.0 29	18.8 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Togara
Togara NS 38

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Togara
Togara NS 38

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: ← Rangal Coal Measures →
Aries I seam — 293.93
Aries II seam — 295.33
Upper Pollux seam — 305.22
Lower Pollux seam — 309.19 / 311.71 / 312.92
Lower Pollux seam — 325.04
Depth – Vit %, mmf
Section
Thickness: 0.41; 0.80
Source: GSQ Record 1978/14.

MICROLITHOTYPE - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+C | Vt+CD+DC | I | SC+MM

MACERAL - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+E | I | MM

REFLECTANCE
Sample type | Sample Number | Source | R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
us	RC8047 0.69	GSQ 1978/14	100	140	7.3	12.4 db 13.4	29.8 daf 31.3	50.6 daf 63.1						20.77 daf 33.46		0.35 daf 0.44											
ls	RC8048 0.80	GSQ 1978/14	100	134	7.6	12.7 db 13.7	27.5 daf 34.9	52.2 daf 65.7						26.75 daf 33.44		0.30 daf 0.48											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Togara
Togara NS 32

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Togara
Togara NS 32

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: ← Rangal Coal Measures →
Aries seam — 129.70
Pollux seam — 131.45
Virgo seam
Jurgrave Formation
Depth – Vit %, mmf
Section
Thickness: 3.25
Source: GSQ Record 1978/14.

MICROLITHOTYPE - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+C | Vt+CD+DC | I | SC+MM

MACERAL - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+E | I | MM

REFLECTANCE
Sample type | Sample Number | Source | R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ws	RC7541 – 7543 3.25	GSQ Record 1978/14	140	145		11.1 db 11.6	28.7 daf 34.2	55.7 daf 60.3						28.52 daf 33.95	1	0.35 daf 0.42			0.126								

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 168

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 168

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: ← Rangal Coal Measures →
Cancer seam — 69.80 / 70.71
Mammoth seam — 110.29 / 118.04 / 135.74
Pollux seam — 135.74 / 140.08
Pisces seam — 169.55 / 169.80
Depth – Vit %, mmf
Section
Thickness: 0.91; 4.80; 4.34; 4.25
Source: GSQ Record 1973/15

MICROLITHOTYPE - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+C | Vt+CD+DC | I | SC+MM

MACERAL - VOL %
Sample type | Sample number – Thickness analysed | Source | Recovery of wt % | V+E | I | MM

REFLECTANCE
Sample type | Sample Number | Source | R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ms	RC6548 0.91	GSQ Record 1973/15	100	148	1.7	13.6 db 14.9	12.8 daf 16.2	65.9 daf 83.8						28.05 daf 35.51	1	0.28 daf 0.36											
ws	RC6549 4.80	GSQ Record 1973/15			1.7	15.6 db 15.9	16.3 daf 19.8	66.4 daf 80.4	77.2	3.5	5.1 daf 6.0	1.4	0.5	28.92 daf 34.72	1	0.46 daf 0.55			0.078				2.94	42.8 1.9	22.2 1		
ws	RC6554 4.34	GSQ Record 1973/15			1.7	11.1 db 11.3	16.4 daf 16.6	72.8 daf 83.4	78.9	3.7	5.3 daf 6.2	1.4	0.4	31.24 daf 35.91	1	0.40 daf 0.46			0.059				0.44	49.0 2.2	22.5 1		
ms	RC6558 1.25	GSQ Record 1973/15	85.5	152	1.5	20.1 db 20.4	15.3 daf 19.6	63.5 daf 80.4						27.70 daf 35.51	1	0.36 daf 0.44			0.046					45.8 3.2	14.1 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Jellinbah
Blackwater NS 35

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	20·78			GSQ Record 1977/ID
Cancer seam	21·79			
	39·67			
Aries seam	41·88		2·21	
	55·10			
Castor seam	57·76		2·06	
	73·63			
Pollux seam	77·17		3·54	
	80·75			
Orion seam	81·13			
	105·93		1·66	
Pisces seam	107·59			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD

PROXIMATE wt % ad

M	A	VM	FC

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
BHP Blackwater No 28 Bore

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	248·55			CSIRO LR 370
Aries seam	42		1·04	
	249·63			
	287·20			
Castor seam	56		2·43	
	289·62			
	293·48			
Pollux seam	44		2·56	
	295·91			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ccc	LN24254	CSIRO LR 370	89	45	15 mmf	25	15
ws	0·92		55	18	29		
ccc	LN24258		90	39	27 mmf	28	6
ws	2·42		42	29	29		
ccc	LN24261		90	28	24 mmf	38	10
ws	2·48		31	27	42		

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN24254	CSIRO LR 370	89	1·43
	0·92			
ccc	LN24258		90	1·56
ws	2·42			
ccc	LN24261		90	1·44
ws	2·48			

PROXIMATE wt % ad

M	A	VM	FC
1·4	16·1 db 16·3	24·7 daf 29·9 daf	57·8 70·0
1·4	12·1 db 12·3	23·5 daf 27·2 daf	63·0 72·8
1·4	14·2 db 14·4	22·9 daf 27·2 daf	61·5 72·8

ULTIMATE wt % ad

C	H	O	N	S
71·0	4·0	5·5 daf	1·7	0·3
86·1	4·9	6·6	2·0	0·4
74·9	4·2	5·3 daf	1·8	0·3
86·6	4·6	6·1	2·1	0·4
73·6	4·0	4·7 daf	1·7	0·4
87·2	4·8	5·6	2·0	0·4

SE MJ/kg	CSN
28·73 daf 34·82	7
30·15 daf 34·84	5½
29·49 daf 34·96	3

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·47	0·18 ad 0·32 daf	0·29 0·35	0·040		0·04	41	230
0·57							
0·39	0·06 daf 0·07 daf	0·33 0·38	0·034		0·02	41	232
0·45							
0·36	0·01 daf 0·01 daf	0·35 0·42	0·107		0·03	41	218
0·43							

ASH

SiO_2 %	Al_2O_3 %
46·2 27 : 1	16·9
44·9 27 : 1	16·6
39·1 22 : 1	18·0

TRACE

B ppm ad	Ga ppm ad
6	3
4	3·9
5	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Blackwater
Blackwater NS 94

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal CM	35·83			CSIRO LR381
Taurus seam	40		4·76	
	40·59			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
mm	LN25672 LN25694 0·76	CSIRO LR381	46	0 0	10 mmf =	70 79	20
ccc	LN25687		83	25	21 mmf	47	7
ms	4·67			27	23	51	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN25687	CSIRO LR381	83	1·41
ms	4·67			

PROXIMATE wt % ad

M	A	VM	FC
2·0	13·6 db 13·9	24·0 daf 28·4	60·4 71·6

ULTIMATE wt % ad

C	H	O	N	S
72·9	4·0	5·6 daf	1·6	0·3
86·4	4·8	6·6	1·9	0·3

SE MJ/kg	CSN
29·31 daf 34·75	2

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·83	0·26 daf 0·31 daf	0·27 0·32	0·15		0·07	2	2·66
0·65							

ASH

SiO_2 %	Al_2O_3 %
42·1 23 : 1	18·7

TRACE

B ppm ad	Ga ppm ad
4	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Denison
Denison NS 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	81·41		1·32	GSQ Record 1975/23
	82·73			
	93·44		1·15	
			0·84	
	102·57		1·42	
	119·72			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ms	RC7019 1·32	GSQ Record 1975/23	100	1·69
ws	RC7020 0·64		100	1·41
ms	RC7023 1·25		100	1·42
ts	RC7024 0·84		100	1·37
ws	RC7020 7024 2·73		100	1·45
ws	RC 7025 0·45		100	1·34

PROXIMATE wt % ad

M	A	VM	FC
	36·5		
0·7	10·9 db 12·2	32·1 daf 40·9	46·3 59·1
0·0	0·8 db 12·0	28·3 daf 35·7	50·9 64·3
0·5	6·8 db 7·6	29·7 daf 35·9	53·0 64·1
0·3	9·6 db 10·7	29·5 daf 36·8	50·6 63·2
1·4	11·8 db 13·5	28·1 daf 36·6	44·7 63·4

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
25·14 daf 32·07	1½
25·40 daf 32·07	½
27·26 daf 32·96	1
25·90 daf 32·34	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·38 daf 0·48			0·01				
0·48 daf 0·61			0·17				
0·33 daf 0·53			0·04				
0·44 daf 0·55			0·09				
0·36 daf 0·47			0·068				

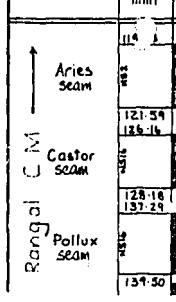
ASH

SiO_2 %	Al_2O_3 %
56·2 23·0 24 : 1	

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Emerald
Emerald NS 2 and 16



PETROGRAPHIC ANALYSES

MACROSCOPIC: Stratigraphy; Depth – Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+C; Vt+CD+DC; I; SC+MM

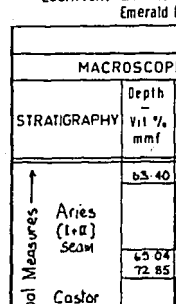
MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

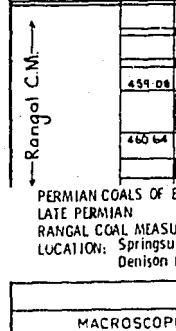
Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
ws	RC6755	GSQ Record 1973/28		1·54		14·9									A												
ms	RC6755 2·01			1·42	5·0	14·6 db 16·4	26·0 daf 32·3	54·4 daf 67·7	82·4	4·7	10·5 daf 13·2	1·6	0·6	27·70 daf 33·92	-	0·48 daf 0·61								54·9	28·2		
ws	RC7152 2·32			1·54	4·4	22·0 db 22·8	25·5 daf 34·6	48·1 daf 65·4						24·90 daf 32·61	1	0·59 daf 0·80								52·1	20·0		
ms	RC7154 - 7155 2·21			1·45	5·0	13·9 db 14·6	26·3 daf 32·4	54·8 daf 67·6						26·84 daf 33·09	~1	0·90 daf 1·11								44·6	16·2		
																								2·8	: 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Emerald
Emerald NS 20 and 55



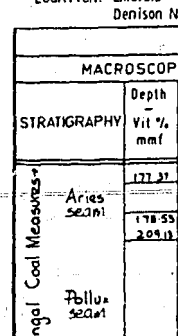
Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
ws	RC 7322 - 1323 1·64	GSQ Records 1974/10 and 1974/6			5·6	19·9 db 15·8	25·1 daf 30·6	54·4 daf 69·4						26·26 daf 31·60	-1	1·44 daf 1·73			0·001					63·3	29·1		
ms	RC 7324 0·86		92·0	1·41	6·6	10·3 db 10·6	25·9 daf 30·6	57·7 daf 69·4						27·84 daf 33·50	1	1·01 daf 1·29			0·001					33	: 1		
ls	RC 7771 1·01		100	1·40	6·6	23·9 db 24·5	27·2 daf 39·1	42·3 daf 60·9						23·26 daf 33·47	1	0·23 daf 0·33											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Emerald
Denison NS 20



Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
ws	RC10877 1·56	GSQ Record 1979/46		1·42	10·1	10·3 db 11·4	29·6 daf 37·0	50·0 daf 62·5						25·29 daf 31·61	½	0·25 daf 0·31			0·12					62·7	12·2		
																								5·1	: 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Springsure
Denison NS 18



Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
ws	RC11156 3·49	GSQ Record 1979/46		1·43	9·4	9·1 db 9·9	27·3 daf 35·3	54·2 daf 66·7						26·03 daf 31·74		0·28 daf 0·32			0·060					53·4	24·7		
																								2·2	: 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Emerald
Denison NS 14

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ga ppm ad
ws	RC9620 1·16	GSQ Record 1978/14	100	1·55	5·3	16·6 db 11·5	23·3 daf 29·4	54·8 daf 70·1						29·95 daf 38·40		0·26 daf 0·33			0·069								
ws	RC9618 1·07		100	1·40	6·3	8·9 db 9·5	29·4 daf 34·6	55·4 daf 65·4						28·63 daf 33·68		0·32 daf 0·38			0·014								
ls	RC9619 2·80		100	1·55	5·2	22·0 db 23·2	29·8 daf 35·3	43·0 daf 64·7						23·99 daf 32·86		0·26 daf 0·36			0·100								

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Emerald
Denison NS 15 and Emerald NS 72

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Rangal Coal Measures / Burngrove Formation	Aries (1) seam 126.24			
	Aries II seam 138.90		2.66	GSQ Record 1978/14
	139.88			
	Castor + Aries III? seam 150.78		0.90	
	166.64			
	Pollux seam 168.65		1.415	
	177.84			
	Virgo seam 179.16			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws'	RC9744	GSQ Record 1978/14	100	1.42	7.7	15.4 db 16.7	26.9 daf 24.9	50.0 daf 65.1						35.46 daf 35.64		0.30 daf 0.39			0.016								
ws'	RC7974		100	1.44	6.5	14.5 db 15.5 10.5	30.3 daf 38.4	48.7 daf 61.6						26.03 daf 33.95	1.2 2	0.20 daf 0.26				0.8							
1.409			1.89	1.39																							
ws'	RC9745		100	1.40	8.4	16.1 db 17.6	28.0 daf 37.3	47.5 daf 62.7						25.13 daf 33.51	2.	0.33 daf 0.44			0.028								
1.41																											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Emerald
Emerald NS 25 and 30

PETROGRAPHIC ANALYSES
CHEMICAL ANALYSES

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Springsure
Denison NS 21

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Rangal Coal Measures / Burngrove Formation	180.07			
	Aries seam 163.77		3.70	GSQ Record 1974/6
	184.66			
	Castor seam 185.52		0.84	
	Pollux seam			
	Virgo seam 235.96		0.94	
	236.69			

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws'	RC7586	GSQ Record 1974/6	100	1.33	9.4	6.4 db 7.1	33.5 daf 39.9	51.7 daf 60.1						26.91 daf 32.04	-	0.35 daf 0.42			0.003					59.3	16.9		
ccc'	3.70																							37	1		
ws'	RC7386		97	1.52	6.3	20.2 db 21.6	32.3 daf 44.0	41.2 daf 56.0						22.82 daf 31.05	1	0.61 daf 0.83								42.2	14.2		
0.84																								3.0	1		
1.409	RC7386		74.9	1.39	7.3	10.4 db 12.3	33.0 daf 40.7	49.3 daf 59.3						28.75 daf 35.02	1	0.56 daf 0.69								48.1	19.1		
0.84																								2.7	1		
ws	RC7445		100	1.50	10.2	21.8 db 31.0	24.2 daf 35.4	43.8 daf 64.0						19.77 daf 31.84	F	0.34 daf 0.55											
0.94																											
1.409	RC7445		62.4	1.46	7.2	20.4 db 22.0	26.4 daf 34.7	46.0 daf 69.3						24.08 daf 35.40	-	0.35 daf 0.51											
0.94																											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Springsure
Denison NS 21

PETROGRAPHIC ANALYSES
CHEMICAL ANALYSES

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	241.66			
	265.15		3.49	GSQ Record 1979/46
	269.12			
	269.35		1.23	
	269.82			
	269.14		1.32	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws'	RC11156	GSQ Record 1979/46	100	1.43	9.4	9.1 db 9.9	27.3 daf 35.3	54.2 daf 66.5						26.03 daf 31.44	0	0.36 daf 0.52			0.66					53.4	24.7		
3.49																								2.2	1		
ws'	RC10884		100	1.43	9.8	11.6 db 12.9	28.0 daf 35.4	50.6 daf 64.6						24.85 daf 31.46	0	0.25 daf 0.32			0.45					60.8	18.2		
1.23																								3.3	1		
ws'	RC11045		100	1.47	8.6	14.7 db 16.1	27.7 daf 36.2	49.0 daf 63.8						24.27 daf 31.60	0	0.29 daf 0.38			0.42					45.4	20.9		
1.32																								2.2	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
RANGAL COAL MEASURES
LOCATION: Denison
Denison NS 4

PETROGRAPHIC ANALYSES
CHEMICAL ANALYSES

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Rangal Coal Measures	33.93			
	34.90		0.97	
	48.84		1.25	
			1.50	
			1.61	
	52.45			
	57.67		1.52	
	59.13			
	76.46		1.30	GSQ Record 1975/23
	77.84			

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws'	RC7094	GSQ Record 1975/23	98	1.81	6.6	9.3 db 11.5	22.7 daf 42.7	59.9 daf 49.8						13.39 daf 26.50		0.29 daf 0.75											
1.25																											
ms	RC7095		96	1.46	9.9	15.7 db 17.4	25.3 daf 34.2	49.1 daf 66.4						23.68 daf 32.00		0.43 daf 0.54											
0.78																											
1.6	RC7097		93	1.39	10.7	9.0 db 10.4	27.7 daf 31.6	52.6 daf 65.8						26.95 daf 32.60		0.52 daf 0.78											
1.50																											
ws'	RC7098			1.58	8.9	25.4 db 27.9	23.0 daf 34.1	40.7 daf 61.9						20.50 daf 31.20		0.44 daf 0.73								42.1	14.7		
3.53																								2.9	1		
ws	RC7099		100		11.6	7.8 db 8.8	30.9 daf 36.5	49.7 daf 64.1						26.19 daf 32.49	1	0.32 daf 0.41								41.1	13.6		
																								3.0	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BANDANNA FORMATION
LOCATION: Consuelo
Consuelo NS 1

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth in Vit % mmf; Section; Thickness; Source

Bandanna Formation

Depth in Vit % mmf	Thickness	Source
26.58	2.99	GSQ Record 1974/13
29.57		
57.76	2.18	
59.94		
65.78	1.23	
67.01		

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

midlustrous is often used in conjunction with bright

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws	RC7123 2.99	GSQ Record 1974/13		1.43	11.2	6.2 db 7.0	29.5 daf 35.9	53.1 daf 64.5						26.57 daf 32.17		0.33 daf 0.40								65.9 29.1	22.5 1		
ws	RC7124 2.18				10.3	13.4 db 14.9	25.7 daf 33.7	50.6 daf 66.5						23.48 daf 30.77		0.45 daf 0.59			0.025					63.6 36.4	17.8 1		
ws	RC7122 1.23		92.0	1.41	11.6	5.4 db 6.1	24.9 daf 34.0	54.6 daf 64.0						26.63 daf 32.08		0.36 daf 0.49			0.025					67.2 40.8	16.7 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BANDANNA FORMATION
LOCATION: Consuelo
Consuelo NS 3

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth in Vit % mmf; Section; Thickness; Source

Bandanna Formation

Depth in Vit % mmf	Thickness	Source
17.18	1.26	GSQ Record 1974/13
18.44		
24.69	1.73	
26.42		
50.94	1.51	
52.45		
68.00	1.39	
69.39		

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

ml = midlustrous is often used in conjunction with bright.

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ws	RC7209 1.24	GSQ Record 1974/13	100	1.46	9.3	15.9 db 17.5	29.7 daf 39.4	45.1 daf 60.4						22.84 daf 30.45		0.25 daf 0.33			0.022					63.9 44	12.2 1		
ws	RC7210 1.73		98.0	1.40	10.7	11.1 db 12.4	27.9 daf 35.8	50.3 daf 64.2						24.68 daf 31.64		0.28 daf 0.36			0.028					60.6 31	19.4 1		
ws	RC7211 1.51		100	1.33	11.8	5.2 db 6.0	32.8 daf 39.2	50.2 daf 60.5						26.52 daf 32.00		0.35 daf 0.42			0.010					49.4 26	18.9 1		
ws	RC7212 1.39		98.0	1.35	13.2	7.0 db 8.1	30.1 daf 38.0	49.7 daf 62.0						25.49 daf 31.86		0.39 daf 0.49			0.061					59.5 31	18.9 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BANDANNA FORMATION
LOCATION: Springsure
Buckland NS 1

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth in Vit % mmf; Section; Thickness; Source

Bandanna Formation

Depth in Vit % mmf	Thickness	Source
20.01	0.99	Record 1974/37
20.46		

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Sample type	Sample number	Source	R_o max
ms		Record 1974/37	0.38

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ms	RC7486 0.89	Record 1974/37			14.6	6.0 db 7.0	31.6 daf 40.0	47.8 daf 60.0						24.46 daf 31.20		3 daf 4.31			0.04					46.4 27	17.1 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BANDANNA FORMATION
LOCATION: Rolleston
Theiss C070

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth in Vit % mmf; Section; Thickness; Source

Bandanna Formation

Depth in Vit % mmf	Thickness	Source
34.98	3.33	Anderson JC and Leblang GM 1975
A Seam 43		
38.31		
42.51	2.90	
B Seam 48		
45.41		
C Seam		
68.27	4.51	
D Seam 75		
72.76		

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vt+CD+DC; I; SC+MM

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM
ccc	LN10550 - 10552 3.26	CSIRO IR893R		34 37	22 mmf 22	38 41	6
ccc	LN10553 - 10555 2.61			31 32	26 mmf 26	41 42	2
ccc	LN10556 - 10558 4.36			61 63	18 mmf 19	18 18	3

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	
ccc	LN10550 - 10552 3.26	CSIRO IR893R		44 48	48 52		8
ccc	LN10553 - 10555 2.61			46 48	50 52		4
ccc	LN10556 - 10558 4.36			72 75	24 mmf 25		4

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Sample type	Sample Number	Source	R_o max
ccc	LN10550 - 10552 3.26	CSIRO IR893R	0.56
ccc	LN10553 - 10555 2.61		0.61
ccc	LN10556 - 10558 4.36		0.58

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ccc	LN10550 - 10552 3.26	Anderson JC and Leblang GM 1975			9.7	10.6 db 11.5	27.0 daf 36.0	52.9 daf 70.0						23.92 daf 26.00		0.39 daf 0.41											
ccc	LN10553 - 10555 2.61				9.9	10.3 db 11.4	27.7 daf 36.8	52.1 daf 69.2						25.84 daf 32.30		0.41 daf 0.51											
ccc	LN10556 - 10558 4.36				10.4	7.1 db 7.9	29.4 daf 36.2	52.6 daf 63.8						26.33 daf 32.11		0.42 daf 0.51											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Baralaba
Baralaba NS 24

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth m/f % mmf	Section	Thickness	Source
Baralaba Coal Measures	55 54			
Moody seam	84		87	
	56 41 84 54			
Boyd seam	59		2 43	
	86 87 122 98			
Cameron seam	67		3 58	
	126 54 165 55			
Reid seam	66		3 41	
	164 56 206 30			
Doubtful seam	80		1 75	
	54		1 14	
	204 96 246 89			
Dawson seam	69		3 27	C.S.I.R.O. L.R.343
	250 16 322 58			
Dunstan + Sub-Dunstan seam	58		4 39	
	70			
	328 40 345 70			
Kabola Member Double seam	57		1 66	
	341 36 450 44			
Unnamed seam	68		2 72	
	453 16			
	460 02			
Dirty seam	46		96	
	460 98			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc ws	LN19540 0 87		-39	60 77	11 mmf 14	7 9	22
ccc ws	LN19541 2 17		-62	44 47	22 mmf 24	27 29	7
ccc	LN19543 3 12		-75	60 56	20 mmf 22	20 22	10
ccc ws	LN19545 3 41		-80	53 55	21 mmf 22	22 23	4
ccc ws	LN19584 1 75		-79	67 71	16 mmf 17	12 12	5
ccc ls	LN19585 1 14		-73	42 44	19 mmf 20	33 36	6
ccc ws	LN19615 3 27		-77	53 56	24 mmf 25	18 19	5
ccc ws	LN19684 4 39		-87	43 44	27 mmf 28	27 28	3
ccc ls	LN19686 0 89		-77	53 61	15 mmf 17	19 22	13
ccc ws	LN19690 1 66		-93	51 46	20 mmf 22	28 32	11
ccc ws	LN19772 2 72		-96	53 58	19 mmf 21	19 21	9
ccc ws	LN19935 0 96	B	-90	33 39	12 mmf 14	40 47	15
			thermally altered coal				

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ccc ws	LN19540 0 87	C.S.I.R.O. L.R.343	-39	1 58	1 3	2 6 2 71	7 9 dis 23 0	3 64 8 dar 36 1	60 5	2 9	6 4	1 4	0 8	23 31 dar 32 35	½	0 82 1 14	0 39 dis 0 54	0 43 dar 0 60	0 60		0 08	1	6 66	29 4 19	15 2 1	4	5
ws	LN19541 2 17		-62	1 60	1 2	11 3 dis 11 4	13 8 15 8	73 7 dar 84 2	78 7	3 6	3 0	1 8	0 4	31 28 dar 36 15	½	0 55 0 57	0 02 dis 0 07	0 49 dar 0 60	0 052		0 08	<1	151	44 1 26	17 1 1	3	2
ccc	LN19543 3 12		-75	1 62	1 2	13 4 13 6	12 1 14 2 dar	73 3 dar 85 8	77 4	3 6	2 2 dar 2 6	1 8	0 4	30 89 dar 36 12	½	0 40 0 47	0 02 dis 0 02	0 38 dar 0 45	0 12		0 06	<1	0 41	53 2 22	24 3 1	8	5
ccc ws	LN19545 3 41		-80	1 37	1 3	8 3 8 4	13 1 14 5	77 3 dar 86 5	82 0	3 7	2 6 dar 2 7	1 8	0 3	32 56 dar 36 03	½	0 41 0 49	0 05 dis 0 07	0 35 dar 0 38	0 069		0 05	<1	0 87	44 3 2 2	19 8 1	2 5	2
ccc ls	LN19584 1 75		-79	1 33	1 2	9 3 9 4	11 6 13 0 dis	77 9 dar 87 0	81 3	3 8	2 2 dar 2 4	1 8	0 4	32 47 dar 36 29	½	0 43 0 48	0 04 dis 0 04	0 39 dar 0 44	0 090		0 04	<1	0 25	48 6 1 8	27 7 1	4	3
ccc ls	LN19585 1 14		-73	1 38	1 2	11 1 11 2	11 7 dar 13 3	76 0 dar 86 7	79 9	3 6	2 9 dar 2 8	1 5	0 3	31 70 dar 36 12	½	0 36 0 41	0 02 dis 0 02	0 34 dar 0 39	0 085		0 05	<1	0 80	45 4 19	24 5 1	3	3
ccc ws	LN19615 3 27	C.S.I.R.O. L.R.343	-77	1 37	1 3	9 1 9 2	12 3 13 8 dis	77 3 dar 86 2	81 7	3 7	2 2 dar 2 6	1 6	0 4	32 52 dar 36 21	½	0 40 0 45	0 00 dis 0 00	0 40 dar 0 45	0 099		0 04	1	0 62	47 1 22	21 7 1	2 5	1 5
ccc ws	LN19684 4 39		-87	1 34	1 3	6 2 6 3	11 1 12 0 dis	81 4 88 0	84 6	3 7	2 2 dar 2 4	1 7	0 3	33 59 dar 36 33	½	0 35 0 38	0 01 dis 0 01	0 34 dar 0 37	0 044		0 03	1	0 30	49 4 17	28 9 1	2	2
ccc ls	LN19686 0 89		-77	1 44	1 4	14 7 14 9	10 8 12 8 dis	73 1 dar 87 1	76 3	3 5	2 2 dar 2 8	1 6	0 3	30 18 dar 36 90	½	0 32 0 38	0 03 dis 0 04	0 29 dar 0 34	0 17		0 04	<1	0 11	56 3 20	28 5 1	4	6
ccc ws	LN19690 1 66		-93	1 46	1 4	15 0 15 2	10 5 12 5 dis	73 1 dar 87 5	76 9	3 4	1 9 dar 2 5	1 6	0 3	30 12 dar 36 03	½	0 36 0 43	0 02 dis 0 00	0 36 dar 0 43	0 17		0 04	<1	0 29	56 4 24	23 1 1	6	6
ccc ws	LN19772 2 72		-96	1 47	1 6	10 2 10 4 dis	9 8 11 1	78 4 dar 88 9	80 5	3 5	2 1 dar 2 5	1 8	0 3	31 73 dar 35 96	½	0 35 0 40	0 02 dis 0 02	0 33 dar 0 38	0 29		0 06	<1	0 28	46 9 19	29 6 1	5	4
ccc ws	LN19935 0 96		-90	1 30	1 4 4	10 4 10 9	3 0 dis 3 8	82 2 dar 86 5	81 6	0 9	1 4 dar 1 0	0 7	0 2	28 19 dar 35 05		0 26 0 31	0 16 dis 0 20	0 10 dar 0 11	0 35		0 01	2	1 23	36 2 22	16 9 1	4	2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Banana
Moura Borehole No 2296

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth m/f % mmf	Section	Thickness	Source
Baralaba Coal Measures C seam	40 69			
	58		7 54	C.S.I.R.O. L.R.364
	48 23			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
ccc	LN22960 7 47	C.S.I.R.O. L.R.364	-85	42 45	24 mmf 25	28 30	6

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ccc	LN22960 7 47	C.S.I.R.O. L.R.364	-85	-1 34	1 7	9 8 10 0 do	19 6 22 1 dar	68 9 77 9	78 6	4 2	3 7 dar 4 2	1 6	0 4	31 94 dar 35 96		0 79 0 89	0 42 dis 0 47	0 37 dar 0 42	0 006		0 10	1	0 02	57 0 1 9	29 6 1	30	2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Banana
Moura Borehole No 2296

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Banana Creek
Moura NS 73

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Baralaba Coal Measures	32.69			GSQ Report 51 and Record 1971/18
A seam	55.84		3.15	
	189.12			
B seam			4.99	
	194.11			
	233.25			
C seam			4.65	
	237.90			
	330.24			
D seam			7.02	
	357.26			

MICROLITHOTYPE - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery or wt %	V+C	V1+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery or wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery or wt %	RD
ccc'	RC2962 3.15	GSQ Report 51 and Record 1971/18	95	1.43
160F	RC2962 3.15		86.5	1.37
ccc'	RC4916 4.99			1.36
188F	RC4916 4.99			1.38
ccc'	RC2964 4.65		98	1.46
160F	RC2964 4.65		78.9	1.38
ccc'	RC2965 7.02		84	1.37
188F	RC2966 7.02		98.1	1.35

PROXIMATE wt % ad

M	A	VM	FC
2.0	16.3	18.9	62.8
	db 16.6	daf 23.1	76.9
2.0	10.8	18.0	69.2
	db 11.0	daf 20.6	79.4
1.9	10.6	17.6	69.0
	db 10.8	daf 20.6	79.4
1.9	8.4	17.6	72.1
	db 8.6	daf 19.6	80.4
1.9	21.0	16.3	60.8
	db 21.3	daf 21.1	78.9
1.9	11.1	16.8	70.2
	db 11.3	daf 19.3	80.7
1.9	10.4	17.3	70.7
	db 10.5	daf 19.9	80.5
1.5	8.1	16.8	71.6
	db 8.2	daf 18.6	81.4

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN
28.31 daf 34.65	2½
	4
31.38 daf 36.24	5½
	6
27.35 daf 35.47	1
	2½
31.62 daf 35.70	6½
	6½

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.66 daf 0.91							
0.46 daf 0.53					0.11		0.4
0.49 daf 0.47							
0.49 daf 0.54			0.08		0.02		0.6
0.31 daf 0.40							
0.49 daf 0.46							
0.30 daf 0.34							
			0.10		0.05		0.01

ASH

SiO_2 %	Al_2O_3 %
45.7	28.2
1.6	1
44.6	28.4
1.6	1
44.3	23.9
2.0	1
58.7	29.7
1.8	1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: West Moura
West Moura NS 144 R

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
←Kaloola Member— Baralaba Coal Measures	535.79			CSIRO LR 388
No 1 seam	67		1.19	
	536.41			
	563.32			
No 2 seam	67		1.94	
	565.86			
	588.35			
No 4 seam	66		1.56	
	590.10			
	629.87			
No 5 + No 6 seam	74 (60)		1.84	
	634.17			
	671.23			CSIRO LR 388
No 7 Tops seam	58 (68)		1.97	
	673.20			
	700.30			
No 8 seam	65		2.04	
	702.54			
	737.69			
No 10 seam	64		2.96	
	740.65			
	774.46			
No 11 seam	70		2.81	
	777.18			

MICROLITHOTYPE - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery or wt %	V+C	V1+CD+DC	I	SC+MM
ws'	LN32329 1.22			52 60	12 mmf 14	23	13
ccc' ws'	LN37095 1.94			55 59	20 mmf 21	20	5
ws'	LN36028			50 59	12 mmf 14	23	15
ws'	LN34342 +34343 3.46			60 65	16 mmf 17	17	7
155F	LN34347 +34348			45 47	24 mmf 25	27	4
ls'	LN34344 1.97			45 48	20 mmf 21	30	5
155F	LN34344			65 67	21 mmf 22	31	3
ws'	LN36032 2.04			44 56	15 mmf 14	20	21
ws'	LN36037 2.96			47 55	16 mmf 19	23	14
ws'	LN34345 2.81			67 71	15 mmf 16	13	5

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery or wt %	RD
ws'	LN32329 1.22	CSIRO LR 388		1.10
ccc' ws'	LN37095 1.94			1.10
ws'	LN36028			1.49
ws'	LN34342 +34343 3.46			1.37
ls'	LN34344 1.97			1.37
ws'	LN36032 2.04			1.55
ws'	LN36037 2.96			1.65
ws'	LN34345 2.81			1.35

PROXIMATE wt % ad

M	A	VM	FC
1.0	17.5 db 17.7	21.6 daf 26.6	59.9 72.4
1.0	12.8 db 13.0	22.1 daf 25.7	63.8 74.3
1.4	20.7 db 21.0	19.2 daf 24.6	58.8 75.4
1.3	10.3 db 10.4	22.3 daf 25.1	66.5 74.9
0.9	10.0 db 10.1	20.3 daf 22.6	68.5 77.2
1.1	25.8 db 26.1	17.8 daf 24.5	55.1 75.5
1.2	16.7 db 16.9	15.6 daf 22.6	63.5 77.4
1.0	9.5 db 9.6	19.4 daf 21.4	71.1 78.6

ULTIMATE wt % ad

C	H	O	N	S
72.0	4.1	3.5 daf 4.4	1.6	0.3
75.8	4.2	4.0 daf 4.7	1.6	0.3
68.6	3.8	3.7 daf 4.7	1.6	0.3
79.2	4.4	3.3 daf 3.7	1.7	0.2
79.7	4.3	2.9 daf 3.4	1.6	0.3
65.0	3.6	2.8 daf 3.7	1.3	0.2
73.5	3.9	3.2 daf 3.8	1.3	0.2
73.5	3.9	3.2 daf 2.7	1.3	0.2

SE MJ/kg	CSN
28.97 daf 35.48	8½
30.65 daf 35.66	8½
27.77 daf 35.61	8
32.00 daf 36.04	9
32.11 daf 36.14	7½
25.80 daf 35.43	6½
29.65 daf 36.13	7½
33.09 daf 36.54	7½

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.47 daf 0.58	0.19 daf 0.22	0.29 0.36	0.11				
0.48 daf 0.56	0.19 daf 0.22	0.29 0.34	-				
0.48 daf 0.62	0.15 daf 0.19	0.33 0.43	-				
0.52 daf 0.56	0.15 daf 0.16	0.19 0.21	0.050				
0.27 daf 0.42	0.10 daf 0.11	0.27 0.31	0.041				
0.32 daf 0.44	0.09 daf 0.12	0.23 0.32	-				
0.30 daf 0.37	0.12 daf 0.15	0.18 0.22	-				
0.40 daf 0.44	0.04 daf 0.06	0.34 0.38	0.022				

ASH

SiO_2 %	Al_2O_3 %
20.4	
21.6	
15.6	
13.4	
13.5	
22.9	
19.8	
16.6	

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Moura No 1
Mungi Moura NS 61 and 67

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Baralaba Coal Measures

X+A? seam — 110.08 — 114.63 — 4.55

B Tops seam — 131.97 — 135.15 — 3.18

B Bottoms seam — 138.61 — 142.07 — 3.46

C seam — 142.07 — 148.61 — 6.54

D + E Top seam — 199.80 — 218.59 — 2.74 — 221.33

GSO Report No73 and Record 1972/1

CHEMICAL ANALYSES

Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ms	RC2471 4.55	GSO Report No73 and Record 1972/1	95.8	1.45	1.5	17.7	22.4	58.4						27.61	+	0.63											
						18.0	27.4	12.6						34.09		0.64											
1.65R	RC2411 4.55		73.9	1.38	2.0	8.1 db	21.4	68.5							5	0.58			0.09		9.30		0.37			
						8.3	23.8	76.2								0.60											
ws	RC2472 3.46		98.7	1.44	1.4	19.7	19.7	60.2						27.45	3½	0.56											
						15.4 db	23.5 daf	76.3						35.07		0.69											
1.65R	RC2472 3.46		78.7	1.41	1.6	9.2 db	23.2 daf	69.2							4½	0.55			0.01		0.26		0.28			
						10.0	25.1	78.3								0.69											
ws	RC2081 5.66		94.0	1.38	1.0	10.3 db	21.6 daf	66.1																			
						10.4	24.2	74.3																			
1.45R	RC2081 5.66		87.5	1.34	1.0	6.9	22.4 daf	69.7						32.87	6				0.005		0.20					
							24.9	75.8						39.73													
ms	RC2473 2.74		91.6	1.45	1.4	15.6 db	18.9 daf	64.1						29.17	3												
						15.8	21.4	77.2						35.14													
1.50R	RC2473 2.74		86.5	1.41	1.8	10.2 db	19.5 daf	67.5							5				0.09		0.19		0.46			
						11.1	22.3	77.7																			

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: West Moura
West Moura NS 142 and 142 A

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth Vit % mmf; Section; Thickness; Source

MICROLITHOTYPE - VOL %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+C; Vt+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

Baralaba Coal Measures — Kaloola Member

No1 seam — 534.70 — 539.08 — 4.38

No2 seam — 569.01 — 570.46 — 1.87

No5 seam — 627.94 — 629.89 — 1.95

No6 seam — 662.71 — 665.35 — 2.64

No7 seam — 695.09 — 699.54 — 4.45

No8 seam — 713.50 — 715.65 — 2.15

No10 seam — 756.09 — 758.32 — 2.23

No11 seam — 793.05 — 795.75 — 2.70

CSIRO LR387

CHEMICAL ANALYSES

Sample type; Sample number - Thickness analysed; Source; Recovery of wt %; RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg; CSN

MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ws	LN33363 2.38	CSIRO LR387		1.67	1.7	27.3 db 27.8	19.3 daf 27.1	51.7 72.9	61.0 64.0	3.4 4.8	5.0 daf 6.9	1.4 2.0	0.2 0.3	24.15 daf 34.02	7	0.41 0.58	0.17 daf 0.24	0.24 0.34	0.02				3.35	50.1 22	22.3 1		
ccc	2.38		62	18 mmf 20																							
ws	LN33364 1.87				1.43	1.2	15.2 db 15.4	21.2 daf 25.4	62.4 74.6	7.3 3 8.8	4.0 4.7	4.5 daf 5.2	1.7 2.0	0.3 0.3	29.39 daf 35.19	8.2	0.46 0.55	0.19 daf 0.23	0.27 0.32	0.044				2.83	44.1 26	16.9 1		
ccc	1.87		53	16 mmf 20																							
			58	20																							
ws	LN33638 1.95				1.38	1.7	10.8 db 11.0	20.2 daf 23.0	67.3 77.0	7.9 8.9	4.5 4.9	2.8 daf 3.3	1.7 1.9	0.3 0.3	31.54 daf 36.09	9	0.38 0.43	0.08 daf 0.09	0.30 0.34	0.012				0.78	45.7 19	24.3 1		
ccc	1.95		56	17 mmf 19																							
			61	20																							
ws	LN33365 2.64				1.55	1.5	24.1 db 26.5	18.2 daf 25.2	54.3 74.8	6.3 8.2	3.5 4.8	3.4 daf 4.8	1.4 1.9	0.2 0.3	25.59 daf 35.33	7	0.35 0.48	0.11 daf 0.15	0.24 0.33	0.065				2.06	53.1 2.4	22.2 1		
ccc	2.64		44	18 mmf 25																							
			57	20																							
ws	LN33639 4.45				1.42	1.5	14.1 db 14.3	18.2 daf 21.5	66.2 78.5	7.5 8.9	4.1 4.8	2.7 daf 3.2	1.5 1.8	0.3 0.3	30.29 daf 35.89	8.2	0.40 0.47	0.13 daf 0.15	0.27 0.32	0.088				0.99	47.4 1.9	24.4 1		
ccc	4.45		46	20 mmf 21																							
			50	27																							
ws	LN37040 2.15				1.54	1.4	27.4 db 27.8	15.3 daf 21.5	55.9 78.5	6.3 8.9	3.4 4.1	2.9 daf 4.3	1.2 1.6	0.3 0.4	25.38 daf 35.65	2	0.34 0.48	0.08 daf 0.11	0.26 0.37					1.14				
ccc	2.15		40	18 mmf 22																							
			49	29																							
ws	LN37041 2.27				1.38	1.1	10.9 db 11.0	19.1 daf 21.7	68.9 78.3	7.8 8.9	4.1 4.7	3.5 daf 3.8	1.3 1.5	0.3 0.4	31.79 daf 36.10	8	0.36 0.41	0.08 daf 0.09	0.32 0.36					1.36				
ccc	2.27		53	18 mmf 22																							
			57	19																							
ws	LN34341 2.70				1.34	0.9	10.5 db 10.6	17.8 daf 20.1	70.8 79.9	7.9 8.9	4.1 4.7	3.1 daf 3.3	1.4 1.6	0.3 0.4	32.14 daf 36.27	7.4	0.40 0.45	0.07 daf 0.08	0.33 0.37	0.008				0.93				
ccc	2.70		62	17 mmf 18																							
			65	17																							

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION Banana Creek
Moura NS 57

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source
Baralaba Coal Measures	435.96			
A seam			4.95	GSQ Report 51 and Record 1971/18
	440.90			
	486.79			
B seam			6.17	
	492.96			
	576.17			
C seam			8.79	
	584.96			
	632.23			
D seam			3.66	
	635.89			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
ccc	RC2284 4.95	CSIRO LR346	86	45	28 mmf 29	2.5 2.6	4

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
MS	RC2284 4.95	CSIRO LR346	84.6	1.44	1.1	12.6 12.7 db	14.0 16.2	72.3 85.0						31.12 36.15	1	0.35 0.32											
150F	RC2284 4.95	CSIRO LR346	70.3	1.40	1	9.7 9.8 db	14.2 15.9	75.0 84.1							1	0.47 0.53			0.10		0.23		0.10				
ccc MS	RC2285 6.17	CSIRO LR346	62	1.42	1.1	12.8 12.9 db	14.1 16.4	73.0 83.6						31.12 36.14	½	0.54 0.63											
160F	RC2285 6.17	CSIRO LR346	89.8	1.38	1.1	9.3 9.4 db	19.5 16.2	75.1 83.8							1	0.55 0.61			0.02		0.18		0.11				
ccc MS	RC2286 8.79	CSIRO LR346	77.4	1.42	1.2	12.0 12.1 db	13.2 15.2	73.6 84.8						31.54 36.34	0	0.52 0.60											
150F	RC2286 8.79	CSIRO LR346	83.1	1.39	1.2	9.4 9.5 db	13.4 15.0	76.0 85.0							½	0.40 0.35			0.03		0.29		0.10				
ccc MS	RC2287 3.66	CSIRO LR346	92.1	1.44	0.9	12.7 12.8 db	12.5 14.4	73.9 85.5						27.86 32.25	1	0.46 0.53											
150F	RC2287 3.66	CSIRO LR346	85.7	1.37	1.0	8.1 8.2 db	12.9 14.2	78.0 85.8							1	0.50 0.55			0.02		0.18		N.I				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Moura
Moura Borehole 1294

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source
Baralaba C.M.	21.17			
C seam	60		5.41	CSIRO LR346
	26.58			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
ccc	LN21376 5.28	CSIRO LR346	86	45	28 mmf 29	2.5 2.6	4

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc	LN21376 5.28	CSIRO LR346	86	1.35	1.9	9.1 9.3 db	25.5 28.7 daf	63.5 71.3	77.1 86.5	4.4 4.9 daf	5.5 6.3	1.6 1.8	0.4 0.5	31.33 35.17 daf	5	0.52 0.58	0.10 0.11 daf	0.42 0.47	0.008		0.10	2	1.04	44.6 21.1	23.5	15	25

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Moura
Moura Borehole 1294

CHEMICAL ANALYSES

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Moura No 1 Mine Area
Moura NS 22

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Moura No 1 Mine Area
Moura NS 22

PETROGRAPHIC ANALYSES — MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Baralaba Coal Measures				
	119.40			
X Seam			1.68	GSQ Rept 35 and Record 1968/3
	122.25			
	190.80			
A Seam			1.83	
	192.65			
	217.85			
B Seam			5.18	
	223.01			
	269.50			
C Seam			5.36	
	272.06			
	292.03			
D Seam			2.31	
	294.53			

PETROGRAPHIC ANALYSES — MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ws'	1683/65	GSQ Report 35 and Record 1968/3	91	62	19	11	8
1.68							
ws'	1684/65		63	67	21	12	
1.83							
ws'	1689/65		96	62	21	11	6
5.18							
ws'	1694/65		88	62	21	11	6
5.36							
ws'	1695/65		97	62	21	11	6
2.31							

PETROGRAPHIC ANALYSES — MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ws'	1683/65	GSQ Report 35 and Record 1968/3	91	59	18	23
1.68						
ws'	1684/65		63	66	14	20
1.83						
ws'	1689/65		96	63	14	23
5.18						
ws'	1694/65		88	63	12	25
5.36						
ws'	1695/65		97	63	14	23
2.31						

PETROGRAPHIC ANALYSES — REFLECTANCE

Sample type	Sample Number	Source	R_o max
ws'	1683/65	GSQ Report 35 and Record 1968/3	1.59
1.68			
ws'	1684/65		1.46
1.83			
ws'	1689/65		1.38
5.18			
ws'	1694/65		1.35
5.36			
ws'	1695/65		1.38
2.31			

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ws'	1683/65	GSQ Report 35 and Record 1968/3	91	1.59
1.68				
ws'	1684/65		63	1.46
1.83				
ws'	1689/65		96	1.38
5.18				
ws'	1694/65		88	1.35
5.36				
ws'	1695/65		97	1.38
2.31				

CHEMICAL ANALYSES — PROXIMATE wt % ad

Sample type	Sample number – Thickness analysed	M	A	VM	FC
ws'	1683/65	1.8	23.4 db	21.3 daf	53.5 daf
1.68			23.8	29.5	71.5
1.35F	1683/65	1.6	10.0 db	23.1 daf	65.1 daf
1.68			10.2	26.2	73.8
ws'	1684/65	1.4	21.1 db	21.7 daf	55.8 daf
1.83			21.4	28.0	72.0
1.35F	1684/65	1.2	10.4 db	23.7 daf	64.7 daf
1.83			10.5	26.8	73.2
ws'	1689/65	1.4	13.0 db	23.5 daf	62.1 daf
5.18			13.2	27.9	72.5
1.35F	1689/65	1.5	6.8 db	23.9 daf	67.8 daf
5.18			6.9	26.1	73.9
ws'	1694/65	1.2	8.1 db	23.7 daf	67.0 daf
5.36			8.2	26.1	73.9
1.35F	1694/65	1.6	5.7 db	23.5 daf	69.2 daf
5.36			5.8	25.4	74.6
ws'	1695/65	1.4	13.8 db	21.2 daf	63.6 daf
2.31			14.0	25.0	75.0
1.35F	1695/65	1.5	7.7 db	25.4 daf	67.4 daf
2.31			7.8	25.8	74.2

CHEMICAL ANALYSES — ULTIMATE wt % ad

Sample type	Sample number – Thickness analysed	C	H	O	N	S
ws'	1683/65					
1.68						
ws'	1684/65					
1.83						
ws'	1689/65					
5.18						
ws'	1694/65					
5.36						
ws'	1695/65					
2.31						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	SE MJ/kg	CSN
ws'	1683/65		3
1.68			
1.35F	1683/65	30.17 daf	6½
1.68		32.89	
ws'	1684/65		2½
1.83			
1.35F	1684/65	31.09 daf	4½
1.83		33.16	
ws'	1689/65	30.10 daf	6
5.18		33.16	
1.35F	1689/65	33.03 daf	7½
5.18		36.02	
ws'	1694/65	32.84 daf	6
5.36		36.21	
1.35F	1694/65	33.56 daf	6
5.36		36.20	
ws'	1695/65	30.13 daf	7½
2.31		33.60	
1.35F	1695/65	33.10 daf	8
2.31		36.45	

CHEMICAL ANALYSES — MINOR wt % ad

Sample type	Sample number – Thickness analysed	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
ws'	1683/65	0.33							
1.68		0.44 daf							
1.35F	1683/65	0.31 daf			0.04				
1.68		0.35							
ws'	1684/65	0.30							
1.83		0.34 daf							
1.35F	1684/65	0.31 daf			0.01				
1.83		0.35							
ws'	1689/65	0.34 daf							
5.18		0.40							
1.35F	1689/65	0.33 daf			0.07				
5.18		0.36							
ws'	1694/65	0.43 daf							
5.36		0.41							
1.35F	1694/65	0.33 daf			0.07				
5.36		0.36							
ws'	1695/65	0.46 daf							
2.31		0.47							
1.35F	1695/65	0.42 daf			0.01				
2.31		0.44							

CHEMICAL ANALYSES — ASH

Sample type	Sample number – Thickness analysed	SiO_2 %	Al_2O_3 %
ws'	1683/65		
1.68			
1.35F	1683/65		
1.68			
ws'	1684/65		
1.83			
1.35F	1684/65		
1.83			
ws'	1689/65		
5.18			
1.35F	1689/65		
5.18			
ws'	1694/65		
5.36			
1.35F	1694/65		
5.36			
ws'	1695/65		
2.31			
1.35F	1695/65		
2.31			

CHEMICAL ANALYSES — TRACE

Sample type	Sample number – Thickness analysed	B ppm ad	Ga ppm ad
ws'	1683/65		
1.68			
1.35F	1683/65		
1.68			
ws'	1684/65		
1.83			
1.35F	1684/65		
1.83			
ws'	1689/65		
5.18			
1.35F	1689/65		
5.18			
ws'	1694/65		
5.36			
1.35F	1694/65		
5.36			
ws'	1695/65		
2.31			
1.35F	1695/65		
2.31			

PERMIAN COALS OF EASTERN AUSTALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Theodore
Theodore NS 27/47 R

PERMIAN COALS OF EASTERN AUSTALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Theodore
Theodore NS 27/47 R

PETROGRAPHIC ANALYSES — MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Kaloola Member — Baralaba Coal Measures				
	75.16			
No 2 Top seam	78		5.33	CSIRO LR384
	80.94			
	106.05			
No 2 Bottom seam	57		2.66	
	108.11			
	153.43			
No 3 + No 4 Top seam	63		3.98	
	167.41			
	66.18			
No 4 Bottom + No 5 seam	60		1.93	
	68.11			
	99.15			
No 6 seam	61		3.68	
	102.83			
	135.60			
No 7 seam	68		3.25	
	138.85			
	177.17			
No 8 seam	67		2.99	
	180.16			
	241.09			
Uncontrolled seam	79		1.70	
	242.79			

PETROGRAPHIC ANALYSES — MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ccc'	LN24521	CSIRO LR384	91	62	19	11	8
ws'	1.78			67	21	12	
ccc'	LN24522		91	41	30 mmf	24	5
ws'	2.91			43	32	25	
ccc'	LN24525		87	41	29 mmf	27	3
ws'	2.66			42	30	28	
ccc'	LN24556		81	45	31 mmf	20	4
	3.89			47	32	21	
ccc'	LN24717		86	46	21 mmf	25	8
	1.88			50	23	27	
ccc'	LN24720		85	45	28 mmf	22	8
	3.33			46	30	24	
ccc'	LN24723		83	52	26 mmf	18	4
	2.78			56	27	19	
ccc' ws'	LN24572 – 24576		50	52	30 mmf	13	5
	2.99			55	32	13	
ccc'	LN24726		88	46	16 mmf	11	7
	1.63			71	17	12	

PETROGRAPHIC ANALYSES — MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ccc'	LN24521	CSIRO LR384	91	59	18	23
ws'	1.78			66	14	20
ccc'	LN24522		91	63	12	25
ws'	2.91			63	14	23
ccc'	LN24525		87	62	14	24
ws'	2.66			62	14	24
ccc'	LN24556		81	62	14	24
	3.89			63	12	25
ccc'	LN24717		86	63	14	23
	1.88			63	14	23
ccc'	LN24720		85	62	14	24
	3.33			63	12	25
ccc'	LN24723		83	62	14	24
	2.78			62	14	24
ccc' ws'	LN24572 – 24576		50	62	14	24
	2.99			62	14	24
ccc'	LN24726		88	62	14	24
	1.63			62	14	24

PETROGRAPHIC ANALYSES — REFLECTANCE

Sample type	Sample Number	Source	R_o max
ccc'	LN24521	CSIRO LR384	1.40
ws'	1.78		
ccc'	LN24522		1.40
ws'	2.91		
ccc'	LN24525		1.39
ws'	2.66		
ccc'	LN24556		1.36
	3.89		
ccc'	LN24717		1.41
	1.88		
ccc'	LN24720		1.39
	3.33		
ccc'	LN24723		1.34
	2.78		
ccc' ws'	LN24572 – 24576		1.37
	2.99		
ccc'	LN24726		1.39
	1.63		

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc'	LN24521	CSIRO LR384	91	1.40
ws'	1.78			
ccc'	LN24522		91	1.40
ws'	2.91			
ccc'	LN24525		87	1.39
ws'	2.66			
ccc'	LN24556		81	1.36
	3.89			
ccc'	LN24717		86	1.41
	1.88			
ccc'	LN24720		85	1.39
	3.33			
ccc'	LN24723		83	1.34
	2.78			
ccc' ws'	LN24572 – 24576		50	1.37
	2.99			
ccc'	LN24726		88	1.39
	1.63			

CHEMICAL ANALYSES — PROXIMATE wt % ad

Sample type	Sample number – Thickness analysed	M	A	VM	FC
ccc'	LN24521	4.2	10.6 db	34.6 daf	50.6 daf
ws'	1.78		11.1	40.6	59.4
ccc'	LN24522	4.3	10.6 db	31.1 daf	49.0 daf
ws'	2.91		11.1	36.6	63.4
ccc'	LN24525	3.9	8.1 db	31.7 daf	56.3 daf
ws'	2.66		8.4	36.2	64.0
ccc'	LN24556	3.6	7.4 db	33.9 daf	55.2 daf
	3.89		7.7	38.1	61.9
ccc'	LN24717	4.0	11.9 db	29.7 daf	55.4 daf
	1.88		12.4	35.3	64.7
ccc'	LN24720	3.5	12.2 db	30.4 daf	53.9 daf
	3.33		12.6	36.1	63.9
ccc'	LN24723	3.2	6.8 db	33.3 daf	56.7 daf
	2.78		7.0	37.1	62.9
ccc' ws'	LN24572 – 24576	2.5	8.0 db	29.8 daf	59.7 daf
	2.99		8.2	33.3	66.7
ccc'	LN24726	2.9	10.6 db	32.0 daf	54.5 daf
	1.63		10.9	34.9	63.1

CHEMICAL ANALYSES — ULTIMATE wt % ad

Sample type	Sample number – Thickness analysed	C	H	O	N	S
ccc'	LN24521	67.9	4.2	11.5 daf	1.4	0.2
ws'	1.78	19.7	5.0	13.4	1.7	0.2
ccc'	LN24522	68.7	4.1	10.6 daf	1.5	0.2
ws'	2.91	30.8	4.9	12.4	1.7	0.2
ccc'	LN24525	71.7	4.3	10.1 daf	1.7	0.2
ws'	2.66	81.4	4.9	11.5	2.0	0.2
ccc'	LN24556	71.9	4.6	10.6 daf	1.6	0.2
	3.89	80.7	5.2	12.1	1.8	0.2
ccc'	LN24717	68.2	4.1	10.0 daf	1.6	0.2
	1.88	81.1	4.9	11.7	2.0	0.3
ccc'	LN24720	68.1	4.2	10.1 daf	1.6	0.3
	3.33	80.8	5.0	12.1	1.8	0.3
ccc'	LN24723	72.8	4.6	10.6 daf	1.6	0.4
	2.78	91.0	5.1	11.7	1.8	0.4
ccc' ws'	LN24572 – 24576					
	2.99					
ccc'	LN24726	70.1	4.3	9.6 daf	1.4	0.5
	1.63	81.6	5.3	10.9	1.6	0.6

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	SE MJ/kg	CSN
ccc'	LN24521	27.51 daf	1
ws'	1.78	32.05	
ccc'	LN24522	27.66 daf	½
ws'	2.91	32.94	
ccc'	LN24525	28.98 daf	½
ws'	2.66	32.94	
ccc'	LN24556	29.68 daf	1
	3.89	33.31	
ccc'	LN24717	27.56 daf	½
	1.88	32.80	
ccc'	LN24720	27.65 daf	½
	3.33	32.73	
ccc'	LN24723	3403 daf	1
	2.78	33.37	
ccc' ws'	LN24572 – 24576	25.71 daf	1
	2.99	33.54	
ccc'	LN24726	29.08 daf	1
	1.63	33.49	

CHEMICAL ANALYSES — MINOR wt % ad

Sample type	Sample number – Thickness analysed	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
ccc'	LN24521	0.28	0.07 daf	0.21	0.036		0.02	3	2.88
ws'	1.78	0.33	0.08	0.25					
ccc'	LN24522	0.32	0.14 daf	0.18	0.010		0.02	3	1.21
ws'	2.91	0.37	0.16	0.21					
ccc'	LN24525	0.24	0.03 daf	0.21	0.022		0.01	3	1.19
ws'	2.66	0.27	0.03	0.24					
ccc'	LN24556	0.26	0.04 daf	0.22	0.028		0.02	2	0.61
	3.89	0.29	0.04	0.25					
ccc'	LN24717	0.34	0.09 daf	0.25	0.003		0.02	3	0.48
	1.88	0.40	0.10	0.30					
ccc'	LN24720	0.30	0.04 daf	0.26	0.003		0.01	1	1.18
	3.33	0.36	0.05	0.31					
ccc'	LN24723	0.42	0.06 daf	0.36	0.007		0.01	16	0.46
	2.78	0.47	0.07	0.40					
ccc' ws'	LN24572 – 24576	0.42			0.005				
	2.99	0.47							
ccc'	LN24726	0.68	0.20 daf	0.48	0.003		0.00	19	0.86
	1.63	0.74	0.23	0.55					

CHEMICAL ANALYSES — ASH

Sample type	Sample number – Thickness analysed	SiO_2 %	Al_2O_3 %
ccc'	LN24521	50.9	30.7
ws'	1.78	1.5	.1
ccc'	LN24522	49.5	25.9
ws'	2.91	1.7	1
ccc'	LN24525	36.0	24.4
ws'	2.66	1.6	1
ccc'	LN24556	46.6	29.6
	3.89	1.6	1
ccc'	LN24717	54.8	34.8
	1.88	2.2	1
ccc'	LN24720	51.0	23.6
	3.33	2.2	1
ccc'	LN24723	51.5	26.3
	2.78	2.0	1
ccc' ws'	LN24572 – 24576		
	2.99		
ccc'	LN24726	62.4	15.4
	1.63	4.1	1

CHEMICAL ANALYSES — TRACE

Sample type	Sample number – Thickness analysed	B ppm ad	Ga ppm ad
ccc'	LN24521	25	15
ws'	1.78		
ccc'	LN24522	15	1
ws'	2.91		
ccc'	LN24525	25	15
ws'	2.66		
ccc'	LN24556	100	2
	3.89		
ccc'	LN24717	100	3
	1.88		
ccc'	LN24720	100	25
	3.33		
ccc'	LN24723	100	15
	2.78		
ccc' ws'	LN24572 – 24576		
	2.99		
ccc'	LN24726	100	15
	1.63		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Kianga - Moura
Moura NS 33

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
A seam	203.26 / 48 / 205.75 / 231.38		0.46	CSIRO LR360
B seam	53		3.93	
Unnamed seam	238.31 / 241.76 / 241.93 / 279.70		0.18	
C Top seam	58		13.05	
C Bottom seam	63		3.91	
D seam	62		3.11	
E Top seam	75		2.56	
E Middles seam	404.43 / 412.56 / 413.09 / 414.41		0.51	
E Bottoms seam	80 / 416.19		0.72	

MICROLITHOTYPE - VOL %

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
A seam	ccc	LN22483		88	32	23 mmf	35	10
	ws	0.46			36	26	38	
B seam	ccc	LN22485		93	36	28 mmf	31	5
	ws	3.93			38	29	33	
Unnamed seam	B	LN22484		64	25	17 mmf	31	5
	ccc	0.18			34	23	43	
C Top seam	ccc	LN22490 +343+347 +428 1.48		90	39	20 mmf	26	15
					46	23	31	
C Bottom seam	ccc	LN22486		86	46	26 mmf	23	5
	ws	3.91			48	28	24	
D seam	ccc	LN22492		87	49	21 mmf	26	4
	ws	3.1			51	22	27	
E Top seam	ccc	LN22494		88	60	16 mmf	15	9
		2.55			66	18	16	
E Middles seam	ccc	LN22470 +22496 1.23		93	47	7 mmf	9	37
					75	11	14	

MACERAL - VOL %

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

STRATIGRAPHY	Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
A seam	ccc	LN22483	CSIRO LR360	88	1.38
	ws	0.46			
B seam	ccc	LN22485		93	1.32
	ws	3.93			
Unnamed seam	B	LN22484		64	1.49
	ccc	0.18			
C Top seam	ccc	LN22490 +343+347 +428 1.48		90	1.43
C Bottom seam	ccc	LN22486		86	1.30
	ws	3.91			
D seam	ccc	LN22492		87	1.30
	ws	3.1			
E Top seam	ccc	LN22494		88	1.32
		2.55			
E Middles seam	ccc	LN22470 +22496 1.23		93	1.47

PROXIMATE wt % ad

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	M	A	VM	FC
A seam	ccc	LN22483	2.0	17.5 db 17.7	25.7 daf 31.8	55.0 daf 68.2
	ws	0.46				
B seam	ccc	LN22485	1.9	12.4 db 12.6	26.8 daf 31.5	58.9 daf 68.7
	ws	3.93				
Unnamed seam	B	LN22484	1.7	31.1 db 31.6	21.2 daf 31.4	46.1 daf 68.6
	ccc	0.18				
C Top seam	ccc	LN22490 +343+347 +428 1.48	2.0	23.5 db 24.0	23.8 daf 32.0	50.7 daf 68.0
C Bottom seam	ccc	LN22486	1.9	10.6 db 10.8	26.3 daf 30.1	61.2 daf 69.9
	ws	3.91				
D seam	ccc	LN22492	1.9	9.5 db 9.7	26.0 daf 29.4	62.6 daf 70.6
	ws	3.1				
E Top seam	ccc	LN22494	1.5	12.9 db 13.1	25.5 daf 29.6	60.1 daf 70.2
E Middles seam	ccc	LN22470 +22496 1.23	0.9	29.5 db 29.8	22.6 daf 32.5	47.0 daf 67.5

ULTIMATE wt % ad

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	C	H	O	N	S
A seam	ccc	LN22483	69.7	4.2	4.9 daf	1.5	0.4
	ws	0.46	86.4	5.2	6.2	1.8	0.4
B seam	ccc	LN22485	74.1	4.3	5.4 daf	1.6	0.3
	ws	3.93	86.4	5.0	6.3	1.9	0.4
Unnamed seam	B	LN22484					
	ccc	0.18					
C Top seam	ccc	LN22490 +343+347 +428 1.48					
C Bottom seam	ccc	LN22486	76.5	4.5	4.5 daf	1.7	0.3
	ws	3.91	87.4	5.1	5.3	1.9	0.3
D seam	ccc	LN22492	77.7	4.5	4.5 daf	1.6	0.3
	ws	3.1	87.7	5.1	5.1	1.7	0.4
E Top seam	ccc	LN22494	75.2	4.4	4.1 daf	1.5	0.4
		2.55	87.4	5.2	4.6	1.8	0.5
E Middles seam	ccc	LN22470 +22496 1.23	60.9	3.7	3.2 daf	1.4	0.5
			87.5	5.3	4.5	2.0	0.7

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	SE MJ/kg	CSN
A seam	ccc	LN22483	28.30 daf 33.09	4
	ws	0.46		
B seam	ccc	LN22485	30.07 daf 33.05	6½
	ws	3.93		
Unnamed seam	B	LN22484	23.56 daf 35.07	2
	ccc	0.18		
C Top seam	ccc	LN22490 +343+347 +428 1.48	25.83 daf 34.67	
C Bottom seam	ccc	LN22486	31.33 daf 35.68	7½
	ws	3.91		
D seam	ccc	LN22492	31.65 daf 35.75	7
	ws	3.1		
E Top seam	ccc	LN22494	30.93 daf 34.14	7½
		2.55		
E Middles seam	ccc	LN22470 +22496 1.23	24.8 daf 35.6	6

MINOR wt % ad

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
A seam	ccc	LN22483	0.42 daf 0.51	0.07 daf 0.09	0.35 0.43	0.012		0.08	5	0.80
	ws	0.46								
B seam	ccc	LN22485	0.36 daf 0.42	0.04 daf 0.05	0.32 0.37	0.062		0.06	1	1.24
	ws	3.93								
Unnamed seam	B	LN22484	0.41 daf 0.27			0.003				
	ccc	0.18								
C Top seam	ccc	LN22490 +343+347 +428 1.48	0.52 daf 0.70			0.033				
C Bottom seam	ccc	LN22486	0.34 daf 0.39	0.04 daf 0.04	0.30 0.35	0.006		0.04	1	0.60
	ws	3.91								
D seam	ccc	LN22492	0.36 daf 0.41	0.04 daf 0.05	0.32 0.36	0.006		0.02	2	0.50
	ws	3.1								
E Top seam	ccc	LN22494	0.44 daf 0.51	0.02 daf 0.02	0.42 0.49	0.002		0.02	3	0.16
		2.55								
E Middles seam	ccc	LN22470 +22496 1.23	0.42 daf 0.60	0.01 daf 0.03	0.40 0.57	0.002		0.04	2	1.06

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
A seam	ccc	LN22483	51.7	24.4	15	5
	ws	0.46	2.4	1		
B seam	ccc	LN22485	41.4	24.0	10	3
	ws	3.93	1.7	1		
Unnamed seam	B	LN22484				
	ccc	0.18				
C Top seam	ccc	LN22490 +343+347 +428 1.48				
C Bottom seam	ccc	LN22486	50.4	25.1	10	4
	ws	3.91	2.0	1		
D seam	ccc	LN22492	50.6	26.6	10	2.5
	ws	3.1	1.9	1		
E Top seam	ccc	LN22494	67.6	19.6	15	4
		2.55	3.4	1		
E Middles seam	ccc	LN22470 +22496 1.23	84.0	6.3	15	2
			13.3	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Theodore
Theodore NS 42

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
No.2 Tops seam	65.11 / 75 / 67.00 / 101.00		3.89	GSQ Report No.42.
No.2 Bottoms seam	76 / 105.36 / 149.24		4.36	
No 3 + No 4 + No 5 seam	72 / 159.61 / 229.95		10.37	
No.6 seam	73 / 232.40 / 263.44		4.13	
No.7 seam	79 / 266.48 / 302.99		2.54	
No 8 seam	84 / 306.43 / 319.38		2.74	
Kaloola Mbr. No.9 Tops seam	73 / 319.68 / 338.09		1.39	
No 9 Bottoms seam	88 / 336.11		1.08	

mil = mid lustrous

MICROLITHOTYPE - VOL %

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - WT %

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
No.2 Tops seam	ccc	PS336 -339 2.98	GSQ Report No.42.		71 mmf 74	24 26	5
	ws	2.98					
No.2 Bottoms seam	ccc	PS340 -345 4.36			74 mmf 76	22 23	3
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86			69 mmf 72	27 28	4
No.6 seam	ccc	PS362 -366 2.45			64 mmf 73	25 27	6
No.7 seam	ccc	PS368 -376 3.55			75 mmf 79	20 21	5
No 8 seam	ccc	PS372 -376 3.35			80 mmf 84	15 6	5
No.9 Tops seam	ws	PS378 1.09			69 mmf 73	25 27	6
No 9 Bottoms seam	ws	PS379 0.60			67 mmf 88	9 12	24

REFLECTANCE

STRATIGRAPHY	Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
No.2 Tops seam	ccc	PS336 -339 2.98	GSQ Report No.42.		1.35
No.2 Bottoms seam	ccc	PS340 -345 4.36			1.32
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86			1.32
No.6 seam	ccc	PS362 -366 2.45			1.32
No.7 seam	ccc	PS368 -376 3.55			1.50
No 8 seam	ccc	PS372 -376 3.35			1.31
No.9 Tops seam	ws	PS378 1.09			1.33
No 9 Bottoms seam	ws	PS379 0.60			1.45

PROXIMATE wt % ad

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	M	A	VM	FC
No.2 Tops seam	ccc	PS336 -339 2.98	6.8	11.0 db 11.8	22.3 daf 39.3	49.9 daf 60.7
	ws	2.98				
No.2 Bottoms seam	ccc	PS340 -345 4.36	6.9	5.6 db 5.9	32.4 daf 37.0	55.2 daf 63.0
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86	5.3	7.8 db 8.2	33.1 daf 38.1	53.8 daf 61.9
No.6 seam	ccc	PS362 -366 2.45	5.1	9.1 db 9.6	32.1 daf 37.4	53.7 daf 62.6
No.7 seam	ccc	PS368 -376 3.55	4.8	6.3 db 6.6	33.5 daf 37.7	55.4 daf 62.3
No 8 seam	ccc	PS372 -376 3.35	4.3	8.1 db 8.5	34.4 daf 39.3	53.2 daf 60.7
No.9 Tops seam	ws	PS378 1.09	4.4	11.5 db 11.8	31.2 daf 37.0	53.1 daf 63.0
No 9 Bottoms seam	ws	PS379 0.60	3.9	30.0 db 31.2	25.6 daf 39.0	40.3 daf 61.0

ULTIMATE wt % ad

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	C	H	O	N	S
No.2 Tops seam	ccc	PS336 -339 2.98					
	ws	2.98					
No.2 Bottoms seam	ccc	PS340 -345 4.36					
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86					
No.6 seam	ccc	PS362 -366 2.45					
No.7 seam	ccc	PS368 -376 3.55					
No 8 seam	ccc	PS372 -376 3.35					
No.9 Tops seam	ws	PS378 1.09					
No 9 Bottoms seam	ws	PS379 0.60					

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	SE MJ/kg	CSN
No.2 Tops seam	ccc	PS336 -339 2.98	26.88 daf 32.68	½
	ws	2.98		
No.2 Bottoms seam	ccc	PS340 -345 4.36	28.77 daf 32.80	½
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86	28.52 daf 32.80	½
No.6 seam	ccc	PS362 -366 2.45	28.73 daf 33.49	½
No.7 seam	ccc	PS368 -376 3.55	29.28 daf 33.73	½
No 8 seam	ccc	PS372 -376 3.35	29.54 daf 33.73	2
No.9 Tops seam	ws	PS378 1.09	28.35 daf 33.61	
No 9 Bottoms seam	ws	PS379 0.60	22.40 daf 33.84	

MINOR wt % ad

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
No.2 Tops seam	ccc	PS336 -339 2.98	0.25 daf 0.30							
	ws	2.98								
No.2 Bottoms seam	ccc	PS340 -345 4.36	0.25 daf 0.30							
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86	0.21 daf 0.29							
No.6 seam	ccc	PS362 -366 2.45	0.23 daf 0.34							
No.7 seam	ccc	PS368 -376 3.55	0.32 daf 0.35							
No 8 seam	ccc	PS372 -376 3.35	0.28 daf 0.32							
No.9 Tops seam	ws	PS378 1.09	0.33 daf 0.39							
No 9 Bottoms seam	ws	PS379 0.60	0.60 daf 0.41							

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
No.2 Tops seam	ccc	PS336 -339 2.98				
	ws	2.98				
No.2 Bottoms seam	ccc	PS340 -345 4.36				
No 3 + No 4 + No 5 seam	ccc	PS346 -360 8.86				
No.6 seam	ccc	PS362 -366 2.45				
No.7 seam	ccc	PS368 -376 3.55				
No 8 seam	ccc	PS372 -376 3.35				
No.9 Tops seam	ws	PS378 1.09				
No 9 Bottoms seam	ws	PS379 0.60				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Nipan
Moura NS 45

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Nipan
Moura NS 45

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth / Vit % / mmf	Section	Thickness	Source
Baralaba Coal Measures / Kaloola Member / No.1 seam	94.48			CSIRO LR367
	67 / 67 / 120.22		2.55	
No.2 seam	56		2.66	
	125.08 / 138.25			
No.3 seam	60		1.67	
	139.42 / 180.51			
No.4 seam	63		2.68	
	183.19 / 213.65			
No.5 seam	66		2.44	
	216.09 / 238.81			
No.6 seam	63		2.87	
	241.68 / 244.17			
No.7 seam	70		2.04	
	266.21 / 282.03			
No.8 seam	70		0.93	
	282.96 / 309.74			
No.9 seam	82		0.68	
	310.72 / 329.11			
No.10 seam	80		10.90	
	330.09 / 340.61			
No.11 seam	80		6.18	
	346.74			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CO+DC	I	SC+MM
ccc	LN22977 2.26	CSIRO LR367	82	50 / 56	20 mmf / 22	20 / 22	10
ccc	LN23028 2.39		87	38 / 40	28 mmf / 30	27 / 30	7
ccc	LN23095 1.63		85	44 / 48	23 mmf / 25	24 / 26	8
ccc	LN23175 2.68		89	47 / 48	30 mmf / 31	21 / 21	2
ccc	LN23266 2.36		90	49 / 53	24 mmf / 26	20 / 21	7
ccc	LN23371 2.62		91	49 / 50	26 mmf / 27	23 / 23	2
ccc	LN23378 1.94		94	58 / 60	18 mmf / 19	20 / 21	4
D	LN23321 0.83		83	57 / 60	18 mmf / 20	19 / 20	6
ccc	LN23391 0.69		89	62 / 76	11 mmf / 13	9 / 11	18
ccc + ws	LN23392 0.96		90	68 / 72	14 mmf / 15	12 / 13	6
ccc	LN23339 LN23340 LN23341 1.40		96	35 / 76	4 mmf / 4	7 / 15	54

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN22977 2.26	CSIRO LR367	82	1.36
ccc	LN23028 2.39		87	1.45
ccc	LN23095 1.63		85	1.35
ccc	LN23175 2.68		89	1.29
ccc	LN23266 2.36		90	1.33
ccc	LN23371 2.62		91	1.30
ccc	LN23378 1.94		94	1.31
D	LN23321 0.83		83	1.32
ccc	LN23391 0.69		89	1.38
ccc + ws	LN23392 0.96		90	1.35
ccc	LN23339 LN23340 LN23341 1.40		96	1.40

PROXIMATE wt % ad

M	A	VM	FC
3.3	13.9 db / 14.3	31.2 / 31.7	51.6 / 62.3
4.6	11.9 db / 12.5	30.3 / 36.2	53.2 / 63.8
3.4	12.1 db / 12.5	29.9 / 35.4	54.6 / 64.6
3.3	8.2 db / 8.4	32.5 / 35.9	58.0 / 64.1
3.7	11.4 db / 11.8	30.2 / 35.5	54.7 / 64.5
2.8	7.6 db / 7.8	31.1 / 34.7	58.5 / 65.3
2.9	9.5 db / 9.8	30.3 / 34.3	58.3 / 65.7
2.5	9.4 db / 9.6	30.5 / 34.1	57.6 / 65.3
3.0	19.6 db / 20.2	28.4 / 36.8	49.0 / 63.2
3.0	12.9 db / 13.3	30.3 / 36.0	53.8 / 64.0
	43.8 db / 44.7		

ULTIMATE wt % ad

C	H	O	N	S
66.4	4.2	10.2 daf / 12.3	1.5	0.3
68.4	4.2	9.1 daf / 10.9	1.6	0.2
69.6	4.3	8.8 daf / 10.3	1.5	0.3
75.5	4.7	8.2 daf / 9.1	1.8	0.3
70.5	4.4	8.1 daf / 9.7	1.6	0.3
74.9	4.6	8.1 daf / 9.1	1.7	0.3
74.0	4.5	8.1 daf / 9.4	1.6	0.4
74.2	4.5	7.5 daf / 8.5	1.5	0.4
64.8	4.1	6.8 daf / 9.8	1.2	0.5
70.8	4.4	6.8 daf / 8.7	1.5	0.6

SE MJ/kg	CSN
27.10 daf / 32.73	1
27.66 daf / 33.12	1
28.28 daf / 33.49	1
31.07 daf / 34.33	2
28.03 daf / 34.17	2
30.82 daf / 34.36	2
30.52 daf / 34.45	2½
30.26 daf / 34.33	3
26.75 daf / 34.59	3½
29.10 daf / 34.61	5
	2

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.73 / 0.86	0.43 daf / 0.52	0.30 / 0.36	0.060		0.04	1	2.30
0.54 / 0.65	0.29 daf / 0.35	0.25 / 0.30	0.010		0.04	1	1.98
0.45 / 0.53	0.15 daf / 0.18	0.30 / 0.35	0.004		0.04	1	0.78
0.36 / 0.40	0.10 daf / 0.11	0.26 / 0.29	0.038		0.04	<1	0.08
0.46 / 0.54	0.19 daf / 0.22	0.27 / 0.32	0.005		0.04	2	0.24
0.50 / 0.56	0.21 daf / 0.23	0.29 / 0.32	0.007		0.05	2	0.27
0.17 / 0.87	0.42 daf / 0.47	0.35 / 0.40	0.002		0.04	3	0.42
0.62 / 0.70	0.23 daf / 0.26	0.39 / 0.44	0.002		0.04	6	0.29
0.63 / 0.81	0.12 daf / 0.16	0.51 / 0.65	0.004		0.02	19	0.28
0.78 / 0.93	0.22 daf / 0.26	0.56 / 0.67	0.005		0.02	105	0.56
0.47 daf / 0.87			0.009				

ASH

SiO_2 %	Al_2O_3 %
40.0 / 26.5 / 1.5	40 / 1
39.5 / 20.7 / 1.9	25 / 1
51.1 / 25.1 / 2.0	40 / 1
49.7 / 30.2 / 1.6	60 / 1
54.9 / 28.2 / 1.9	45 / 1
49.4 / 26.6 / 1.9	60 / 1
50.4 / 22.4 / 2.3	80 / 1
59.4 / 20.6 / 2.9	60 / 1
66.3 / 18.5 / 3.5	50 / 1
61.8 / 18.1 / 3.4	50 / 1

TRACE

B ppm ad	Ge ppm ad
40	3
25	2.5
40	4
60	2
45	3
60	2
80	2
60	3
50	6
50	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN BOWEN BASIN
BARALABA COAL MEASURES
LOCATION: Theodore
Theodore NS 14

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth / Vit % / mmf	Section	Thickness	Source
Baralaba Coal Measures / Kaloola Member / No 3+4 seam	99.68			CSIRO LR371
	62 / 108.20 / 134.61		6.52	
No 5+6 seam	61		6.50	
	141.11 / 166.99			
No 7 seam	69		2.33	
	169.29 / 185.65			
No 8 seam	68		1.69	
	190.34 / 215.87			
No 9 seam	70		2.07	
	211.44 / 245.89			
No 10 top seam	71		1.85	
	241.05 / 260.97			
No 11 top seam	76		0.90	
	261.87			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CO+DC	I	SC+MM
ccc + ws	LN23440 8.52	CSIRO LR371	97	45 / 49	27 mmf / 29	23 / 24	5
ccc + ws	LN24111 6.50		85	42 / 43	33 mmf / 34	22 / 22	3
ccc + ws	LN24163 2.32		85	51 / 54	28 mmf / 30	15 / 16	6
ccc + ws	LN24206 1.69		90	54 / 55	26 mmf / 26	19 / 19	1
ccc + ws	LN24208 2.07		90	55 / 57	24 mmf / 25	17 / 19	4
ccc + ws	LN24210 1.85		84	52 / 60	19 mmf / 22	16 / 18	13
ccc + ws	LN24212 0.90		88	63 / 69	13 mmf / 14	15 / 17	9

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc + ws	LN23440 8.52	CSIRO LR371	97	1.29
ccc + ws	LN24111 6.50		85	1.37
ccc + ws	LN24163 2.32		85	1.41
ccc + ws	LN24206 1.69		90	1.33
ccc + ws	LN24208 2.07		90	1.34
ccc + ws	LN24210 1.85		89	1.42
ccc + ws	LN24212 0.90		88	1.34

PROXIMATE wt % ad

M	A	VM	FC
5.1	6.1 db / 6.4	33.0 / 37.2	55.8 / 62.8
5.4	5.7 db / 6.0	32.5 / 36.5	56.4 / 63.5
7.0	9.6 db / 10.3	30.3 / 36.3	53.1 / 63.7
7.4	5.1 db / 5.5	30.6 / 35.2	56.7 / 64.8
7.1	6.8 db / 7.3	31.2 / 36.5	54.9 / 63.5
6.8	15.6 db / 16.7	27.7 / 35.4	49.9 / 64.3
7.6	12.9 db / 13.8	28.1 / 36.0	51.4 / 64.0

ULTIMATE wt % ad

C	H	O	N	S
71.2	4.4	11.4 daf / 12.7	1.7	0.1
71.3	4.4	11.4 daf / 12.5	1.7	0.1
67.0	4.1	10.5 daf / 12.5	1.6	0.2
70.9	4.2	11.9 daf / 14.1	1.7	0.3
70.1	4.3	9.7 daf / 11.4	1.7	0.3
63.0	3.9	9.0 daf / 11.6	1.4	0.3
64.9	3.9	8.9 daf / 11.1	1.4	0.4

SE MJ/kg	CSN
28.75 daf / 32.58	½
28.84 daf / 32.45	½
27.03 daf / 32.42	½
28.75 daf / 32.81	½
28.53 daf / 33.10	½
25.59 daf / 32.94	½
26.24 daf / 33.03	½

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.19 / 0.21	0.06 daf / 0.06	0.13 / 0.15	0.030		0.06	2	1.24
0.22 / 0.25	0.08 daf / 0.10	0.14 / 0.15	0.010		0.02	1	0.50
0.27 / 0.32	0.07 daf / 0.08	0.10 / 0.24	0.003		0.01	2	0.72
0.38 / 0.38	0.04 daf / 0.05	0.29 / 0.33	0.003		0.01	2	0.35
0.34 / 0.39	0.04 daf / 0.04	0.30 / 0.35	0.004		0.01	1	0.08
0.29 / 0.37	0.01 daf / 0.01	0.28 / 0.36	0.009		0.01	1	0.04
0.44 / 0.56	0.05 daf / 0.06	0.39 / 0.49	0.003		0.01	1	0.26

ASH

SiO_2 %	Al_2O_3 %
35.6 / 25.1 / 1.4	100 / 1
46.9 / 26.4 / 1.8	80 / 2
49.9 / 23.2 / 2.2	150 / 2.5
43.4 / 24.0 / 2.1	150 / 1.5
67.7 / 19.1 / 3.7	150 / 2
60.1 / 26.7 / 2.3	150 / 6
69.4 / 15.2 / 4.0	150 / 3

TRACE

B ppm ad	Ge ppm ad
100	1
80	2
150	2.5
150	1.5
150	2
150	6
150	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Wendouree
Galilee NS 1 and 3

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
A seam	77.90	NS1 63	3.24	GSQ Record 1973/12
	81.13			
	44.26		2.46	
B seam	NS1 74		2.54	
	97.44			
	168.83			
C seam	NS1 58		2.85	
	71.68 / 165.01			
D seam	NS1 52		4.78	
	189.79 / 234.32			
E seam	NS3		1.53	
	280.90			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
rc'	RC 6811 – 6814	QGMJ 78 (908)	94.4	55	32	13
ws'	3.24			63	37	
rc'	RC 6815 – 6819		99.8	74	26	
ws	3.00					
rc'	RC 6840 – 6841		100	45	33	22
ws	2.85			58	42	
rc'	RC 6842 – 6846		100	41	38	21
ws'	4.78			52	48	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
rc'	RC6840 – 6841	QGMJ 78 (908)	0.51
ws			

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
rc	RC6811 – 6814	GSQ Record 1973/12	99.4	1.50
ws	3.24			
rc'	RC6815 – 6819		99.8	1.42
ws	3.00			
rc'	RC6840 – 6841		100	1.49
ws	2.85			
rc'	RC6842 – 6846		100	1.52
ws'	4.78			
1.40F	RC7012		96.6	1.51
ws'	1.68			

PROXIMATE wt % ad

Sample type	M	A	VM	FC
rc	16.0	13.2 db 15.7	31.1 daf 43.9	39.7 daf 56.1
ws				
rc'	13.3	18.2 db 21.0	29.1 daf 42.5	39.4 daf 57.5
ms				
rc'	9.5	23.4 db 24.8	27.9 daf 41.0	40.2 daf 59.0
ws				
rc'	8.8	21.0 db 23.0	27.7 daf 39.5	42.5 daf 60.5
ws'				
1.40F	6.4	29.1 db 31.3	20.5 daf 32.0	43.5 daf 68.0
ws'				

ULTIMATE wt % ad

Sample type	C	H	O	N	S
rc	55.6	3.3	10.2 daf 14.4	1.1 1.6	0.5 0.7
ws	78.6	4.7			
rc'	54.6	3.4	9.7 daf 13.9	1.3 1.8	0.6 0.8
ms	78.6	4.9			
rc'	52.6	3.4	10.3 daf 15.1	1.1 1.6	0.6 0.9
ws	77.3	5.0			
rc'	54.5	3.7	10.5 daf 14.9	1.1 1.6	0.5 0.7
ws'	77.6	5.2			
1.40F					
ws'					

Sample type	SE MJ/kg	CSN
rc	23.26 daf 32.85	
ws		
rc'	21.89 daf 25.25	
ms		
rc'	21.05 daf 30.91	0
ws		
rc'	21.21 daf 30.21	
ws'		
1.40F	22.67 daf 35.42	
ws'		

MINOR wt % ad

Sample type	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
rc	0.47 daf 0.67			0.008				1.02
ws								
rc'	0.65 daf 0.75			0.010				1.66
ms								
rc'	0.61 daf 0.90			0.037				0.25
ws								
rc'	0.47 daf 0.67			0.034				0.36
ws'								
1.40F	0.42 daf 0.46							
ws'								

ASH

Sample type	SiO_2 %	Al_2O_3 %
rc	56.0 2.8	19.7 1
ws		
rc'	64.7 4.6	14.0 1
ms		
rc'	59.2 2.1	28.2 1
ws		
rc'	50.3 1.6	31.8 1
ws'		
1.40F		
ws'		

TRACE

Sample type	B ppm ad	Ge ppm ad
rc		
ws		
rc'		
ms		
rc'		
ws		
rc'		
ws'		
1.40F		
ws'		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Degulla
Galilee NS 4 and 5

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
A-B. seam	213.39	NSS	5.51	GSQ Record 1973/19
	228.50		4.65	
	281.79			
C seam	NSS		5.45	
	287.24			
	299.04			
D seam	NSS		2.05	
	301.14			
	143.21			
E seam	NSA		1.54	
	144.75			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
1.40F	RC7066 – 7068	GSQ Record 1973/19	98.7	1.54
ws'	5.51			
1.40F	RC7069 – 7070		99.4	1.51
ws'	3.12			
1.40F	RC7073 – 7074		100	1.61
ws'	5.45			
1.40F	RC7075 – 7076		100	1.45
ws	2.05			
1.40F	RC7065		100	1.43
ws	1.54			

PROXIMATE wt % ad

Sample type	M	A	VM	FC
1.40F	9.3	13.0 db 14.3	32.5 daf 41.8	45.2 daf 58.2
ws'				
1.40F	9.4	16.5 db 18.2	31.9 daf 43.0	42.2 daf 57.0
ws'				
1.40F	9.1	29.1 db 32.0	23.8 daf 36.5	39.0 daf 61.5
ws'				
1.40F	9.0	22.6 db 24.8	24.0 daf 42.4	39.4 daf 57.6
ws'				
1.40F	10.6	11.3 db 12.6	29.4 daf 37.6	48.7 daf 62.4
ws'				

ULTIMATE wt % ad

Sample type	C	H	O	N	S
1.40F	84.3	3.5	11.3 daf 14.3	1.1 1.4	0.2 0.3
ws'	72.7	4.5			
1.40F	73.6	4.9	14.6 daf 19.7	1.1 1.5	0.2 0.3
ws'	73.6	4.9			
1.40F	73.0	3.0	12.0 daf 18.4	0.9 1.4	0.3 0.5
ws'	73.9	4.8			
1.40F	73.8	3.4	13.0 daf 18.9	1.1 1.6	0.4 0.6
ws'	73.8	4.9			
1.40F					
ws'					

Sample type	SE MJ/kg	CSN
1.40F	23.26 daf 30.05	0
ws'		
1.40F	21.70 daf 29.28	0
ws'		
1.40F	18.40 daf 29.77	0
ws'		
1.40F	20.45 daf 29.90	0
ws'		
1.40F	23.26 daf 29.78	0
ws'		

MINOR wt % ad

Sample type	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
1.40F	0.23 daf 0.28			0.002				0.84
ws'								
1.40F	0.24 daf 0.32			0.003				0.83
ws'								
1.40F	0.30 daf 0.49			0.004				1.04
ws'								
1.40F	0.44 daf 0.64			0.008				0.87
ws'								
1.40F	0.22 daf 0.28							
ws'								

ASH

Sample type	SiO_2 %	Al_2O_3 %
1.40F	67.2 3.9	17.3 1
ws'		
1.40F	71.3 4.2	17.0 1
ws'		
1.40F	59.6 1.9	32.2 1
ws'		
1.40F	59.0 2.0	29.2 1
ws'		
1.40F	67.2 3.9	17.3 1
ws'		

TRACE

Sample type	B ppm ad	Ge ppm ad
1.40F		
ws'		
1.40F		
ws'		
1.40F		
ws'		
1.40F		
ws'		
1.40F		
ws'		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Laglan
Galilee NS 10

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Laglan
Galilee NS 10

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit %, mmf	Section	Thickness	Source
A-B seam	234.06		2.74	GSQ Record 1974/12
	240.54		3.74	
split off B seam	210.88		0.96	
	267.84			
C seam				
	325.60			
	332.26		4.34	
D seam				
	338.44			
	342.05		2.34	
E seam				
	346.08		1.98	
	348.03			
F seam			3.20	
	351.23			

MICROLITHOTYPE - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery at wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
190F	RC 7242	GSQ Record 1974/12	79.7	1.53	6.6	19.3 db	26.3 daf	47.8 daf	55.2	2.8	13.4 daf	1.0	0.3	22.47 daf	
WS	2.74					20.7	35.5	64.5	75.9	3.8	18.4	1.4	0.5	30.32	
RC	RC 7242					32.4									
190F	RC 7244 - 7246		88.6	1.50	7.7	15.3 db	27.9 daf	49.1 daf	57.9	3.0	14.6 daf	1.1	0.4	23.40 daf	
WS	3.74					23.4	36.2	63.8	75.0	4.0	19.1	1.4	0.5	30.39	
RC	RC 7244 - 7246					23.4									
190F	RC 7247		95.4	1.51	8.9	19.4 db	29.4 daf	42.3 daf	53.7	3.1	33.5 daf	1.1	0.3	22.19 daf	
WS	0.96					21.3	41.0	59.0	74.9	4.3	13.7	1.6	0.5	30.95	
RC						21.5									
190F	RC 7248 - 7249		82.0	1.48	6.2	12.1 db	30.4 daf	49.0 daf	59.2	3.3	14.7 daf	1.1	0.4	24.89 daf	
WS	4.34					13.2	38.8	61.2	75.2	4.2	18.7	1.4	0.5	31.23	
RC	RC 7248 - 7249					23.1									
190F	RC 7250 - 7251		86.7	1.73	6.1	34.5 db	23.0 daf	36.4 daf	42.2	1.8	14.3 daf	0.8	0.3	17.21 daf	
15'	2.34					36.7	38.7	61.3	72.3	3.1	22.7	1.4	0.5	28.92	
RC	RC 7250 - 7251					38.2									
190F	RC 7252		81.6	1.46	7.7	8.9 db	33.5 daf	59.1 daf	62.5	4.7	14.7 daf	1.1	0.4	26.05 daf	
WS	1.98					9.6	34.9	61.1	74.1	5.6	17.7	1.3	0.5	31.24	
RC	RC 7252					17.6									
190F	RC 7269 - 7271		90.0	1.53	7.4	13.0 db	28.8 daf	50.3 daf	57.0	2.9	14.9 daf	1.1	0.4	24.26 daf	
WS	3.20					14.1	36.4	63.6	74.8	3.8	19.5	1.4	0.5	30.67	
RC	RC 7269 - 7271					29.1									

MINOR wt % ad

Sample type	Sample number - Thickness analysed	TS	S P+S	S O	P	F	Cl	As ppm	CO_2
190F	RC 7242	0.34 daf			0.008				0.27
WS	2.74	0.46							
RC	RC 7242								
190F	RC 7244 - 7246	0.41 daf			0.007				0.80
15'	3.74	0.53							
RC	RC 7244 - 7246								
190F	RC 7247	0.35 daf			0.007				1.21
WS	0.96	0.44							
RC									
190F	RC 7248 - 7249	0.40 daf			0.010				0.69
WS	4.34	0.50							
RC	RC 7248 - 7249								
190F	RC 7250 - 7251	0.31 daf			0.020				0.70
15'	2.34	0.52							
RC	RC 7250 - 7251								
190F	RC 7252	0.40 daf			0.006				0.74
WS	1.98	0.53							
RC	RC 7252								
190F	RC 7269 - 7271	0.40 daf			0.007				
WS	3.20	0.51							
RC	RC 7269 - 7271								

ASH

Sample type	Sample number - Thickness analysed	SiO_2 %	Al_2O_3 %
190F	RC 7242	74.5	18.3
WS	2.74	4.1	1
RC	RC 7242		
190F	RC 7244 - 7246	67.0	19.6
15'	3.74	3.4	1
RC	RC 7244 - 7246		
190F	RC 7247	74.1	11.2
WS	0.96	6.6	1
RC			
190F	RC 7248 - 7249	59.5	26.3
WS	4.34	2.3	1
RC	RC 7248 - 7249		
190F	RC 7250 - 7251	61.3	29.7
15'	2.34	2.1	1
RC	RC 7250 - 7251		
190F	RC 7252	64.0	26.6
WS	1.98	2.4	1
RC	RC 7252		
190F	RC 7269 - 7271	54.1	31.1
WS	3.20	1.7	1
RC	RC 7269 - 7271		

TRACE

Sample type	Sample number - Thickness analysed	B ppm ad	Ga ppm ad
190F	RC 7242		
WS	2.74		
RC	RC 7242		
190F	RC 7244 - 7246		
15'	3.74		
RC	RC 7244 - 7246		
190F	RC 7247		
WS	0.96		
RC			
190F	RC 7248 - 7249		
WS	4.34		
RC	RC 7248 - 7249		
190F	RC 7250 - 7251		
15'	2.34		
RC	RC 7250 - 7251		
190F	RC 7252		
WS	1.98		
RC	RC 7252		
190F	RC 7269 - 7271		
WS	3.20		
RC	RC 7269 - 7271		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Lambton Meadows
Galilee NS 14/15R

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Lambton Meadows
Galilee NS 14/15R

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit %, mmf	Section	Thickness	Source
B seam	99.45		2.26	GSQ Record 1974/137
	102.21			
C seam	183.05		2.87	
	185.92			
	201.65		0.73	
	202.38			
	215.14		2.33	
D seam				
	217.19			

MICROLITHOTYPE - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery at wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
190F	RC 7442	GSQ Record 1974/137	100	1.54	10.3	7.8 db	32.1 daf	49.8 daf	60.1	3.5	16.3 daf	1.4	0.4	25.63 daf	
WS	2.35					15.2	34.3	65.7	73.4	4.3	19.9	1.7	0.5	31.37	

MINOR wt % ad

Sample type	Sample number - Thickness analysed	TS	S P+S	S O	P	F	Cl	As ppm	CO_2
190F	RC 7442	0.42 daf							1.12
WS	2.35	0.52							

ASH

Sample type	Sample number - Thickness analysed	SiO_2 %	Al_2O_3 %
190F	RC 7442		
WS	2.35		

TRACE

Sample type	Sample number - Thickness analysed	B ppm ad	Ga ppm ad
190F	RC 7442		
WS	2.35		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Moray Downs
Galilee NS 21

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY: Bandanna Formation — A-B seam; C seam; D seam; E seam; F seam

Depth — Vit % mmf: 92.98; 101.47; 102.37; 105.22; 168.55; 171.28; 176.37; 181.35; 219.02; 221.86; 230.66; 235.15

Section

Thickness: 8.49; 2.85; 2.73; 4.98; 2.84; 4.49

Source: GSQ Record 1974/28

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
WS	RC7647 – 7651 8.49						
WS	RC7652 – 7653 2.85						
WS	RC7655 – 7656 2.73						
WS	RC7657 – 7660 4.98						
WS	RC7660 – 7661 2.84						
WS	RC7662 – 7663 4.49						

MACERAL - V %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
RC	RC7647 – 7651 8.49		100	34	36	25
				51 mmf		49
RC	RC7652 – 7653 2.85		100	48	22	27
				55 mmf		45
RC	RC7655 – 7656 2.73		100	41	23	36
				70 mmf		30
RC	RC7657 – 7660 4.98		100	47	30	23
				60 mmf		40
RC	RC7660 – 7661 2.84		100	37	42	21
				43 mmf		57
RC	RC7662 – 7663 4.49		100	20.5	54	26
				22 mmf		78

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REFLECTANCE

Sample type	Sample number	Source	R_o max
WS	RC7655 – 7656 2.73		0.51

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
POF	RC7647 – 7651 8.49		85.7	1.49
WS	RC7647 – 7651 8.49			
RC	RC7647 – 7651 1.49			
POF	RC7652 – 7653 2.85		86.0	1.56
WS	RC7652 – 7653 2.85			
RC	RC7652 – 7653 2.85			
POF	RC7655 – 7656 2.73		83.4	1.60
WS	RC7655 – 7656 2.73			
RC	RC7655 – 7656 2.73			
POF	RC7657 – 7660 4.98		91.8	1.53
WS	RC7657 – 7660 4.98			
RC	RC7657 – 7660 4.98			
POF	RC7660 – 7661 2.84		88.2	1.49
WS	RC7660 – 7661 2.84			
RC	RC7660 – 7661 2.84			
POF	RC7662 – 7663 4.49		87.5	1.60
WS	RC7662 – 7663 4.49			
RC	RC7662 – 7663 4.49			

GSQ Record 1974/28

PROXIMATE wt % ad

M	A	V.M.	F.C.
6.7	16.1 db; 17.2 daf; 24.5	30.2; 34.1	48.0; 60.2
8.0	19.7; 24.4 db; 27.1	27.9; 38.6 daf	44.4; 61.4
7.3	16.7; 18.0 db; 23.0	29.8; 39.2 daf	46.2; 60.8
12.0	28.7; 32.1 db; 38.6 daf	49.8; 61.9	58.0
8.4	19.5; 21.3 db; 26.0	24.6; 34.7 daf	47.5; 65.9
4.6	25.2; 26.4 db; 35.8	27.4; 34.0 daf	42.8; 61.0

ULTIMATE wt % ad

C	H	O	N	S
56.4	2.8	15.3; 20.3 daf	1.2; 1.5	0.2
52.7	2.8	16.2; 21.1 daf	1.2; 1.6	0.2
55.8	3.1	16.8; 20.8 daf	1.2; 1.6	0.2
58.0	3.2	15.5; 19.4 daf	1.2; 1.5	0.2
54.1	2.8	13.5; 18.8 daf	1.1; 1.6	0.2
53.1	2.8	15.3; 20.3 daf	1.2; 1.5	0.2

SE MJ/kg	CSN
22.92; 29.69 daf	
21.50; 29.74 daf	
27.99; 30.25 daf	
23.83; 30.35 daf	
24.43; 33.88 daf	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.24; 0.31 daf			0.039	0.007			0.17
0.26; 0.33 daf			0.028	0.002			0.28
0.31; 0.41 daf							
0.28; 0.37 daf			0.036	0.006			0.29
0.25; 0.32 daf			0.031	0.004			
0.19; 0.26 daf			0.017	0.005			0.66

ASH

SiO_2 %	Al_2O_3 %
70.1; 31.1	22.7; 1
75.4; 45.1	16.9; 1
72.2; 35.1	22.4; 1
12.8; 4.0	2; 1
56.2; 19.1	29.4; 1

TRACE: B ppm ad; Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Lambton Meadows
GSQ Jericho 1

PETROGRAPHIC ANALYSIS

MACROSCOPIC

STRATIGRAPHY: A seam; B seam; C seam; D upper seam; D lower seam

Depth — Vit % mmf: 130.98; 132.21; 212.17; 214.14; 224.35; 225.69; 242.79; 244.46

Section

Thickness: 1.97; 1.44; 1.67

Source: GSQ Record 1974/37

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
WS	1.97						
WS	1.44						
WS	1.67						

MACERAL - WT %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
POF	RC7741 – 1.97		100	59	30	11
				66 mmf		34
POF	RC7742 – 1.44		98.6	68	25	7
				73 mmf		27
POF	RC7743 – 1.67		100	59	30	11
				66 mmf		34

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REFLECTANCE

Sample type	Sample number	Source	R_o max
POF	RC7741		0.43

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CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
POF	RC7741 – 1.97		84.3	1.44
WS	1.97			
RC	RC7741 – 1.97			
POF	RC7742 – 1.44		98.2	1.41
WS	1.44			
RC	RC7742 – 1.44			
POF	RC7743 – 1.67		95.1	1.44
WS	1.67			
RC	RC7743 – 1.67			

GSQ Record 1974/37

PROXIMATE wt % ad

M	A	V.M.	F.C.
13.8	8.0 db; 9.3 daf; 11.4	33.2; 42.5 daf	45.0; 57.6
15.0	5.6 db; 6.6	31.9; 40.2 daf	47.5; 59.8
11.5	8.2 db; 9.3	31.9; 39.7 daf	48.4; 60.3

ULTIMATE wt % ad

C	H	O	N	S
73.6	4.3	19.1	1.7	0.5

SE MJ/kg	CSN
24.39; 31.19 daf	
25.09; 31.60 daf	
25.26; 31.46 daf	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.34; 0.43 daf			0.005				
0.51; 0.72 daf			0.008				
0.30; 0.37 daf			0.004			16.50	1.12

ASH

SiO_2 %	Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: View Hill
Galilee NS 29

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: View Hill
Galilee NS 29

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth wet / mmf	Section	Thickness	Source
A-	143.95		6.45	GSQ Record 1977/11
	150.40			
	152.10		1.70	
-B seam	154.17			
	154.44		9.59	
C? seam	164.53			
D seam	214.61		5.66	
E top seam	220.27			
	224.12		1.86	
E bottom seam	226.05			
	235.56		1.13	
F seam	236.69			
	250.22		2.96	
	253.18			

MICROLITHOTYPE - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery dr wt %	V+C	VI+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery dr wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery dr wt %	RD
190F	RC8120 - 8123		89.5	1.50
WS	6.45			
190F	RC8124		91.6	1.54
WS	1.70			
190F	RC8125 - 8131		77.6	1.60
WS	9.59			
190F	RC8132 - 8134		94.5	1.47
WS	5.66			
190F	RC8135		98.2	1.44
WS	1.86			
190F	RC8136		98.7	1.48
WS	1.13			
190F	RC8137		84.1	1.54
WS	2.96			

PROXIMATE wt % ad

M	A	VM	FC
1.1	2.2	3.0	4.5
	db 1.5.5	daf 40.0	60.0
0.8	2.3.4	27.5	40.3
	db 25.6	daf 40.6	59.4
0.9	25.2	26.6	39.0
	db 27.8	daf 40.5	59.5
1.1	12.0	29.6	48.4
	db 13.3	daf 38.1	61.9
1.1	6.9	30.4	51.2
	db	daf 37.2	62.7
1.0	13.3	31.0	45.6
	db	daf 40.5	59.5
0.7	13.4	25.0	51.9
	db 32.5	daf 67.5	

ULTIMATE wt % ad

C	H	O	N	S
54.4	3.3	14.6	1.0	0.2
		daf 31.6		
74.3	4.5	19.6	1.3	0.3
49.3	3.1	14.4	1.0	0.2
		daf 21.2		
72.6	4.5	21.2	1.4	0.3
48.6	3.0	13.3	1.0	0.2
		daf 20.0		
73.7	4.5	20.0	1.5	0.3
58.7	3.6	19.4	1.1	0.2
		daf 18.5		
75.2	4.6	18.5	1.4	0.3
60.7	3.5	15.9	1.1	0.3
		daf 14.5		
74.5	4.3	19.5	1.4	0.3
56.5	3.5	15.1	1.1	0.3
		daf 19.7		
73.6	4.8	19.7	1.5	0.4
59.0	3.2	13.4	1.2	0.2
		daf 17.4		
76.7	4.1	17.4	1.5	0.3

SE MJ/kg	CSN
22.26 daf 29.65	
20.32 daf 29.47	
19.65 daf 29.77	
23.93 daf 30.60	
25.01 daf 30.65	
23.50 daf 30.68	
23.38 daf 30.40	

MINOR wt % ad

S								
TS	P+S	O	P	F	Cl	As ppm	CO_2
0.22 daf 0.29			0.004	0.003			0.13
0.21 daf 0.32			0.006	0.004			0.79
0.21 daf 0.32			0.006	0.002			0.96
0.22 daf 0.28			0.006	0.002			0.63
0.28 daf 0.34			0.003	0.003			0.61
0.34 daf 0.44			0.009	0.004			1.22
0.24 daf 0.31							

ASH

SiO_2 %	Al_2O_3 %
78.4	15.8
50	1
80.8	11.0
7.3	1
81.0	10.7
7.6	1
64.3	20.1
3.2	1
53.6	27.3
2.0	1
52.2	27.1
1.9	1

TRACE

B ppm ad	Ga ppm ad

GSQ Record 1977/11

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Galilee
NS 35 P

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Galilee
NS 35 R

PETROGRAPHIC ANALYSES — MACROSCOPIC, MICROLITHOTYPE - VOL %, MACERAL - WT. %, REFLECTANCE

CHEMICAL ANALYSES — PROXIMATE wt % ad, ULTIMATE wt % ad, MINOR wt % ad, ASH, TRACE

STRATIGRAPHY: Depth — Vit % mmf; Section; Thickness; Source

65.71
(29) 28 — 10.43
72.14
100.36
(29) 29 — 1.41
101.77
124.87
(41) 36 — 2.45
127.76
132.63
(33) 32 — 2.12
134.75

GGMJ 78(408)

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: NS 24 Mirtna

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Galilee
NS 24 Mirtna

PETROGRAPHIC ANALYSES — MACROSCOPIC, MICROLITHOTYPE - VOL %, MACERAL - WT. %, REFLECTANCE

CHEMICAL ANALYSES — PROXIMATE air % ad, ULTIMATE wt % ad, MINOR wt % ad, ASH, TRACE

STRATIGRAPHY: Depth — Vit % mmf; Section; Thickness; Source

A-B seam
55.99 / 56.27
split off B seam
74.77
C seam
120.55
70 — 3.66
124.21
C bottom seam
131.28
51 — 1.48
132.76
167.30
D seam
169.77
185.42
32 — 6.30
184.51
E seam
192.63
33 — 3.81
196.44
F seam
209.25
17 — 3.16
212.34

GSQ Record 1976/4

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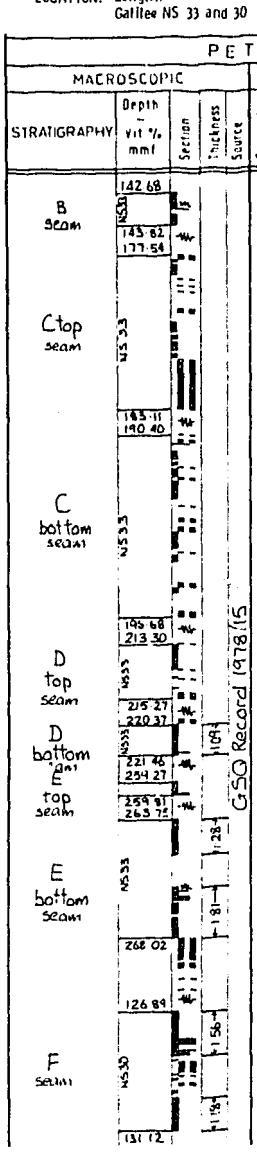
GGMJ 78(408)

GSQ Record 1976/4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Longton
Galilee NS 33 and 30



PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth in situ % mmf	Section	Thickness	Source
B seam	142 68	NS33	1.5	
	145 82			
	177 54			
Ctop seam	NS33			
	185 11			
	190 40			
C bottom seam	NS33			
	196 68			
	213 30			
D top seam	NS33			
	215 27			
	220 37			
D bottom seam	NS33		1.09	
	221 46			
	254 27			
E top seam	259 81		1.28	
	263 75			
E bottom seam	NS33		1.81	
	268 02			
	126 89		1.56	
F seam	NS30			
	131 12		1.84	

MICROLITHOTYPE - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery in situ %	V+C	Vit+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery in situ %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery in situ %	RD
NDE	RCB322		88.9	1.56
TS 1.09				
NDE	RCB323 -RCB324		93.6	1.54
WS 3.09				
NDE	RCB320 -RCB321		93.3	1.55
WS 2.74				

PROXIMATE wt % ad

M	A	VM	FC
7.5	21.3 db 25.0	26.4 daf 37.1	44.8 62.9
10.4	25.8 db 14.7	51.8 daf 33.6	62.2
9.6	14.1 db 15.6	29.0 daf 38.5	47.3 61.5

ULTIMATE at % ad

C	H	O	N	S

SE MJ/kg	CSN

MINOR wt % ad

TS	P+S	O	P	F	Cl	As ppm	CO_2
0.20 daf 0.29							
0.24 daf 0.31							
0.49 daf 0.37							

ASH

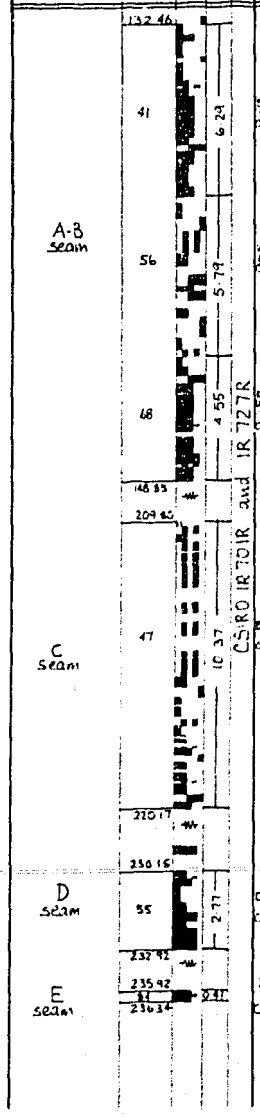
SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Longton
Galilee NS 33 and 30

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GALILEE BASIN
BANDANNA FORMATION
LOCATION: Degulla
Degulla Bore De 14



PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth in situ % mmf	Section	Thickness	Source
A-B seam	132 46			
	41		6.29	
	56		5.79	
	68		4.55	
	148 85			
C seam	209 65		10.37	
	210 17			
D seam	230 15		2.77	
	232 92			
E seam	235 92		0.41	
	236 34			

MICROLITHOTYPE - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery in situ %	V+C	Vit+CD+DC	I	SC+MM
B-D	LN45217			28 24	42	6	
CCC	5.86			24 mmf 25	46		
B-D	LN45219			36 16	27	22	
CCC	2.02			46 mmf 19	35		
B-EE	LN45221 -45350			30 15	20	15	
CCC	4.22			59 mmf 17	24		
B-EE	LN46617			34 13	37	16	
CCC	2.86			41 mmf 15	44		
D-N	LN43345			39 26	31	4	
CCC	2.68			41 mmf 27	32		
B	LN45348			13 12	9	6	
CCC	0.41			77 mmf 13	10		

MACERAL - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery in situ %	V+E	I	MM
B-EE	LN46617			41 47	12	
CCC	2.86			47 mmf 53		
D-N	LN43345			55 40	5	
CCC	2.68			58 mmf 42		
B	LN45348			66 30	4	
CCC	0.41			69 mmf 31		

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery in situ %	RD
B-D	LN45217			1.48
CCC	5.86			
B-D	LN45219			1.58
CCC	2.02			
B-EE	LN45221 -45350			1.52
CCC	4.22			
B-EE	LN46617			1.56
CCC	2.86			
D-N	LN43345			1.41
CCC	2.68			
B	LN45348			1.43
CCC	0.41			

PROXIMATE wt % ad

M	A	VM	FC
9.2	14.3 db 15.6	29.4 daf 31.0	48.1 62.0
5.9	27.7 db 29.4	26.8 daf 40.9	39.6 58.6
8.2	22.2 db 24.1	24.5 daf 42.1	40.5 57.9
8.2	26.9 db 29.3	24.5 daf 31.8	40.4 62.2
8.9	13.4 db 14.1	25.8 daf 33.6	51.8 62.9
8.8	32.3 db 36.7	22.5 daf 42.0	36.4 56.3

ULTIMATE at % ad

C	H	O	N	S
61.8	3.8 daf 78.5	10.1 daf 12.9	1.3 1.6	0.5 0.6
53.2	3.3 daf 78.7	9.4 daf 15.0	1.0 1.6	0.5 0.7
54.3	3.6 daf 77.6	10.1 daf 15.1	1.1 1.6	0.7 1.0
51.4	3.2 daf 79.1	8.8 daf 13.6	1.0 1.6	0.5 0.7
61.4	4.2 daf 78.5	10.3 daf 12.7	1.4 1.7	0.5 0.6
67.0	4.7 daf 77.5	12.4 daf 14.4	1.6 1.8	0.5 0.6

SE MJ/kg	CSN
24.56 daf 31.67	
20.86 daf 31.44	
21.73 daf 31.04	
20.33 daf 31.42	
26.24 daf 32.27	
27.41 daf 31.78	

MINOR wt % ad

TS	P+S	O	P	F	Cl	As ppm	CO_2
0.52 daf 0.65							
0.47 daf 0.71							
0.67 daf 0.96							
0.46 daf 0.71							
0.46 daf 0.56							
0.54 daf 0.63							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GUNNEDAH BASIN
BLACK JACK FORMATION
LOCATION : Howes Hill DDH 1

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GUNNEDAH BASIN
BLACK JACK FORMATION
LOCATION: Howes Hill DDH 1

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth Vit %, mm; Section; Thickness; Source
MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+C; Vi+CD+DC; I; SC+MM
MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+E; I; MM
REFLECTANCE: Sample type; Sample Number; Source; R_o max; R_o cv
PROXIMATE wt % ad: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; RD; M; A; VM; FC
ULTIMATE wt % ad: C; H; O; N; S
SE MJ/kg; CSN
MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2
ASH: SiO_2 %; Al_2O_3 %
TRACE: B ppm ad; Ga ppm ad

Black Jack Coal Measures

STRATIGRAPHY	Depth Vit %, mm	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max	R_o cv	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
No.1 seam	305.49		0.18	GSNSW	ls	LN85813 0.18 PN36544	CSIRO R1397R	100	57	2	8	33	ls	LN85813 0.18 PN36544	CSIRO R1397R	100	40	7	33	ls	LN85813	CSIRO R1397R	0.74	ls	LN85813 0.18	CSIRO R1397R	160		30.4	08	20.9	36.3																				
	305.46								85	12							90	10												42.1	37.1	62.4																			
No2 seam	308.50																																																		
	309.86																																																	
No.3 seam	311.25																																																	
	313.31																																																	
No 4 seam	345.00		5.50		rc	LN85814 5.50 PN36545			21	13	23	43	rc	LN85814 5.50 PN36545			39	24	37	rc	LN85814		1.30	rc	LN85814 5.50				28	48.3	12.8	36.1																			
	350.50								36	24	40						62	38												44.9	25.7	73.9																			
No.5 seam	365.00		4.60		rc	LN85816 4.60 PN36547			16	27	47	10	rc	LN85816 4.60 PN36547			34	51	10	rc	LN85816		0.84	rc	LN85816 4.60				20	55.0	9.6	33.4																			
	369.60								17	32	51						43	57												56.1	22.4	77.6																			
No.6 seam	420.25		1.82		rc	LN85817 1.82 PN36548			13	24	53	10	rc	LN85817 1.82 PN36548			31	54	15	rc	LN85817		0.73	rc	LN85817 1.82				3.0	26.7	22.6	47.7	58.0	3.3	7.3	1.4	0.3														
	422.07								15	29	56						37	63												27.5	32.2	67.8	82.5	4.6	10.6	1.9	0.4														
No.7 seam	422.39		2.01		rc	LN85818 2.01 PN36550			13	13	26	48	rc	LN85818 2.01 PN36550			23	33	44	rc	LN85818		0.71	rc	LN85818 2.01				2.9	52.7	15.9	28.5																			
	424.40								24	25	51						42	58												54.2	35.7	64.3																			
No.8 seam	425.45		2.77		rc	LN85819 2.77 PN36552			14	24	43	19	rc	LN85819 2.77 PN36552			32	52	16	rc	LN85819		0.67	rc	LN85819 2.77				2.7	34.7	20.8	41.8	51.6	3.0	6.6	1.1	0.3														
	428.22								16	30	54						38	62												35.7	33.2	66.8	82.4	4.7	10.7	1.8	0.4														
No 9 seam	442.50																																																	
	444.66																																																	
	456.42		0.30		ws	LN85815 0.30 PN36546			11	14	35	40	ws	LN85815 0.30 PN36546			26	31	43						ws	LN85815 0.30				16	25.8	24.9	47.7	60.3	3.2	7.1	1.4	0.7														
	456.72								19	23	58						45	55												26.2	34.3	65.7	83.0	4.5	9.0	0.9															
No 10 seam	475.10		0.66		ws	LN85820 0.66 PN36553			85	7	4	34	ws	LN85820 0.66 PN36553			60	8	32	ws	LN85820		1.22	ws	LN85820 0.66				26.3	38.9	16.1	41.4																			
	475.6								83	11	6						88	12												39.9	27.6	72.4																			
No 11 seam	481.36		2.00		rc	LN85822 2.00 PN36642			29	27	20	24	rc	LN85822 2.00 PN36642			42	34	24	rc	LN85822		0.93	rc	LN85822 2.00				2.1	24.5	24.5	49.9	60.3	3.5	7.6	1.6	0.4														
	485.55								37	36	27						54	46												23.0	33.4	66.6	82.0	4.8	10.6	2.1	0.5														
No 12 seam	492.67		0.89		rc	LN85821 0.89 PN36554			59	19	7	15	rc	LN85821 0.89 PN36554			64	17	19	rc	LN85821		0.65	rc	LN85821 0.89				2.2	25.4	33.0	39.4	53.4	3.5	13.4	1.3	0.3														
	493.51								69	23	8						78	22												26.0	45.6	54.4	74.4	4.9	10.6	1.8	0.5														

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GUNNEDAH BASIN
BLACK JACK FORMATION
LOCATION : Gunnedah
Collins Gunnedah DDH 16

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN GUNNEDAH BASIN
BLACK JACK FORMATION
LOCATION : Gunnedah
Collins Gunnedah DDH 16

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth Vit %, mm; Section; Thickness; Source
MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+C; Vi+CD+DC; I; SC+MM
MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+E; I; MM
REFLECTANCE: Sample type; Sample Number; Source; R_o max
PROXIMATE wt % ad: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; RD; M; A; VM; FC
ULTIMATE wt % ad: C; H; O; N; S
SE MJ/kg; CSN
MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2
ASH: SiO_2 %; Al_2O_3 %
TRACE: B ppm ad; Ga ppm ad

Black Jack C M

STRATIGRAPHY	Depth Vit %, mm	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max	R_o cv	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
	64.20																																																	
Hoskissons seam	46		0.40	CSIRO LR392	ccc	LN51722 5.45	CSIRO LR392		24	27	43	6	ccc	LN51722 5.45	CSIRO LR392		42	50	8						ccc	LN51722 5.45	CSIRO LR392			6.3	14.9	27.7	52.1	66.1	3.9	9.1	1.4	0.3	26.08 daf 52.72	½	0.34	0.06 daf 0.49	0.33 0.08 daf 0.41	0.004		0.02	<1	1.17	54.7	29.5	25	4
	(52)		3.46		ccc	LN51723 3.38			35	34	31	2	ccc	LN51723 3.38		100	50	47	3						ccc	LN51723 3.38				5.5	7.2	31.0	56.3	71.8	4.4	9.1	1.6	0.4	29.02 daf 33.23	½	0.41	0.04 daf 0.47	0.37 0.05 daf 0.42	0.001		0.01	<1	0.71	53.9	27.2	18	2
	72.60																																																

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
TOMAGO COAL MEASURES
LOCATION: Maitland
Buchanan Maitland and Dagworth Greta Collieries

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Upper Sandgate seam			1.14	
Lower Sandgate seam			0.46	
			0.35	
Upper Buttai seam			1.49	
Lower Buttai seam			2.39	Robinsons Gap Vic Ltd Section 6 Yr 1963
			72	
Unnamed seam			90	
			72	
Coal Measures	~50.00		1.92	CSIRO LR254
Donaldson seam	98			
	51.42			
	~30.00			
Big Ben seam	76		2.34	CSIRO LR255
	32.34			
Tomago Tomago Thin Scotch Derry			0.15	
			0.30	
Upper Rathluba seams			0.42	
	~60.00			
Lower Rathluba seam	89		1.61	CSIRO LR274
	61.61			
Morpeth seam			72	

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM
CCC	LN9345 1.68	CSIRO LR254	100	76	12 mmf 13	4	6
				87	7	4	2
CCC	LN9356 2.29	CSIRO LR255	100	61	23 mmf 24	12	4
				64	24	12	
CCC	LN10439	CSIRO LR274	100	79	9 mmf 10	6	6
				84	10	6	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
130F	LN9344	CSIRO LR254		93	7	
130F	LN9355	CSIRO LR255		98	1	1
130F	LN10347	CSIRO LR274		96	4	

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN9345 1.68	CSIRO LR254	100	1.36	2.9	12.0 db 12.4	35.6 daf 41.8	49.5 daf 58.2	69.0	4.8	6.6	1.8	2.9	28.96 daf 34.05	6½	2.44 1.45	1.50 daf 1.76	1.44 1.69	0.014		0.02	16	0.19	56.1 28	20.2 1	100	2.5
130F	LN9344			3.1	5.2 db 5.3	40.2 daf 42.4	55.5 daf 57.1	vitrain analysis 77.5 82.4	5.5 5.7	7.3 daf 7.7	2.0 2.1	2.0 2.1	32.38 daf 34.49	6½	1.99 2.12	0.39 daf 0.36	1.65 1.76	0.005		0.01		0.03				
CCC	LN9356 2.29	CSIRO LR255	100	1.37	3.1	12.0 db 12.4	52.6 daf 58.6	52.1 daf 61.4	69.8	4.7	6.9 daf 8.2	1.7	1.8	28.87 daf 33.98	3½	1.78 2.10	0.86 daf 0.99	0.94 1.11	0.047		0.00	12	0.02	55.6 19	29.0 1	100	2.5
130F	LN9355			4.0	11.6 db 11.8	53.4 daf 60.8	60.8 daf 69.2	vitrain analysis 78.6 88.6	5.1 5.4	7.3 daf 8.2	2.0 2.1	1.1 1.2	32.35 daf 34.33	7	1.08 1.15	0.03 daf 0.03	1.05 1.11	0.003		0.02		0.06				
CCC	LN10439	CSIRO LR274	100	1.38	2.6	14.3 db 14.7	34.7 daf 41.7	48.4 daf 58.3	67.7	4.9	7.3 daf 8.7	1.6	1.6	28.53 daf 34.08	5½	1.58 1.90	0.88 daf 1.06	0.70 0.84	0.009		0.02	72	0.06	49.9 15	34.2 1	100	6
130F	LN10347			2.5	4.1 db 4.2	36.1 daf 40.8	55.2 daf 59.2	vitrain analysis 77.4 85.0	5.6 5.9	7.3 daf 8.2	1.9 2.1	0.8 0.8	32.49 daf 34.82	5½	0.77 0.85	0.11 daf 0.12	0.66 0.71	0.005		0.02		0.06				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
TOMAGO COAL MEASURES
LOCATION: Maitland
Bloomfield South No 2 Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Tomago C.M. Big Ben seam	~40.00		2.44	CSIRO LR103
	42.44			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM
CCC	LN1697 2.39	CSIRO LR103	100	1.35	2.9	9.8 db 10.7	33.5 daf 38.4	53.8 daf 61.6	72.4	4.9	7.3 daf 8.6	1.8	0.7	29.63 daf 33.94	4½	0.85 0.97	0.18 daf 0.18	0.69 0.79	0.003		0.02	3	0.19	60.7 20	29.6 1	80	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
TOMAGO COAL MEASURES
LOCATION: Beresfield
Kent Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Donaldson seam	~45.00		2.24	CSIRO LR105
	47.24			

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
TOMAGO COAL MEASURES
LOCATION: Maitland
Bloomfield Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Tomago C.M. Big Ben seam	~75.00		2.31	CSIRO LR238
	73			
	77.31			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM
CCC	LN8833 2.24	CSIRO LR238	100	61	19 20	17 17	3
				63			

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
TOMAGO COAL MEASURES
LOCATION: Maitland

Tipton Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Tomago C.M.				
Rathluba seam	45·00			CSIRO LR273
	87		2·13	
	47·13			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ccc'	LN10411 1·60	CSIRO LR273	100	79 82	9 mmf 10	8 8	4

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ccc'	LN10411 1·60	CSIRO LR273	100																								

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Wyee

South Wallarah DDH5

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Newcastle Coal Measures				
Wallarah seam	114·60		0·19	CSIRO LR143
	114·79			
	137·21		0·19	
	137·40			
Great Northern seam	166·29		1·95	
	166·24			
	179·65		0·51	
	180·16			
Fassifern seam	206·65		2·60	
	209·25			
	211·71		0·15	
	211·86			
	256·12		1·08	
	257·20			
	321·30		1·15	
	322·45			
	345·41		1·00	
	346·41			
	349·18			
	350·82			
	368·08		1·00	
	369·08			
	388·81		0·32	
	389·13			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
A	LN1663	CSIRO LR310	87				
ccc'	0·19						
	LN1866		82				
ccc'	0·19						
ccc'	LN1871		83				
	1·76						
ccc'	LN1875		78				
	0·46						
ccc	LN1881		80				
	2·28						
ccc'	LN1885						
	0·15						
ccc'	LN2437						
	0·49						
ccc'	LN2453						
	0·48						
ccc'	LN2463						
	0·79						
ccc'	LN2477		80				
	0·84						
ccc'	LN2478		88				
D	0·36						

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
A	LN1663	CSIRO LR143	87	1·40	2·6	14·6 db 15·0	35·7 daf 45·2	46·9 daf 54·8							3												
ccc'	0·19																										
	LN1866		82	1·40	3·1	23·1 db 23·8	28·3 daf 36·3	45·5 daf 61·7							1												
ccc	0·19																										
ccc'	LN1871		83	1·44	3·3	15·3 db 15·8	29·0 daf 35·6	52·4 daf 64·4	68·4 84·0	4·3 5·3	7·1 daf 8·7	1·4 1·7	0·2 0·3	27·63 daf 33·91	1	0·32 0·39	0·03 daf 0·04	0·29 0·35				1r	2	0·77			
	1·76																										
ccc'	LN1875		78	1·47	3·2	17·7 db 18·3	27·9 daf 35·2	51·2 daf 64·8						26·59 daf 33·59		0·33 daf 0·42											
	0·46																										
ccc	LN1881		80		2·9	18·1 db 19·5	28·3 daf 35·8	50·7 daf 64·2	66·7 84·5	4·2 5·3	6·4 daf 8·1	1·4 1·7	0·3 0·4	26·91 daf 34·08	1	0·37 daf 0·47	0·02 0·03	0·35 0·44			0·01	u	1·02				
	2·28																										
ccc'	LN1885			1·50	2·8	21·4 db 22·0	28·6 daf 37·7	47·2 daf 62·3																			
	0·15																										
ccc'	LN2437			1·43	2·6	19·1 db 19·6	31·3 daf 40·9	47·0 daf 59·1	65·1 85·2	4·5 5·8	6·6 daf 8·4	1·5 1·9	0·6 0·7	27·10 daf 34·61		0·55 daf 0·70							0·67				
	0·49																										
ccc'	LN2453			1·45	2·2	20·9 db 21·4	27·3 daf 35·5	49·8 daf 64·5	64·8 84·2	4·2 5·5	6·1 daf 7·9	1·4 1·9	0·4 0·5	26·61 daf 34·59	2	0·53 daf 0·68							0·14				
	0·48																										
ccc'	LN2463			1·30	2·0	28·0 db 28·6	27·9 daf 34·8	42·1 daf 60·2						24·26 daf 34·63	3½	0·43 daf 0·61											
	0·79																										
ccc'	LN2477		80	1·46	2·2	16·4 db 16·8	30·5 daf 37·5	50·9 daf 62·5	68·5 84·1	4·5 5·6	6·2 daf 7·7	1·7 2·0	0·5 0·6	28·28 daf 34·75	5½	0·47 daf 0·58				0·009			0·33				
	0·84																										
ccc'	LN2478		88	1·42	1·8	11·9 db 18·2	33·4 daf 41·6	46·9 daf 58·4						28·10 daf 35·01	5½												
D	0·36																										

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Adamstown

Boston No2 and Borehill Collieries

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Newcastle Coal Measures				
Victoria Tunnel seam	120·00		1·41	CSIRO LR276
	89			
	121·91			
Young Wallsend seam	60·00		1·54	CSIRO LR310
	91			
	61·54			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ccc'	LN10522 1·61	CSIRO LR276	100	80 85	7 mmf 8	7 7	6
ccc'	LN10548 1·38	CSIRO LR310	100	78 86	9 mmf 10	4 4	9

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
ccc'	LN10522 1·61	CSIRO LR276	100																								
ccc'	LN10548 1·38	CSIRO LR310	100																								

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Belmont
Belmont North Belltop and John Darling Collieries

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Great Northern seam	30.00 – 33.61		3.51	CSIROLR247 CSIROLR244
Fassifern seam	30.00 – 32.15		2.13	CSIROLR247 CSIROLR244
Pilot (Upper) seam		?		
Pilot (Lower) seam		?		
Australasian seam	66.48 – 69.35		2.87	B.H.P.
Montrose seam	172.81 – 175.65		2.84	B.H.P.
Wavehill seam	176.85 – 179.54		2.69	B.H.P.
Fern Valley (Upper) seam	190.46 – 192.24			
Fern Valley (Lower) seam	217.17 – 220.58			
Victoria Tunnel seam	240.00 – 242.41		2.41	CSIROLR262
Nobbys seam	256.03 – 256.91			
Dudley seam	285.66 – 287.50			
Yard seam	293.29 – 294.53			
Borehole seam	300.00 – 302.02		2.02	CSIROLR261 B.H.P.

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ccc	LN8773 2.47	CSIROLR247 CSIROLR244	100	42 44	21 22	53 34	4
ccc	LN9842 1.78	CSIROLR247 CSIROLR244	100	50 51	16 16	32 33	2
ccc	LN9830 2.12	CSIROLR262 CSIROLR262	100	81 87	6 7	6 6	7
ccc	LN9816 1.99	CSIROLR261 CSIROLR261	100	68 73	14 16	11 11	7

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN8773 2.47	CSIROLR247 CSIROLR244	100	1.43
ccc	LN9842 1.78	CSIROLR247 CSIROLR244	100	1.36
130F	LN8861 1.78	CSIROLR247 CSIROLR244		
ccc	C9955-62 2.76	D.H.P.		
ccc	C9963-69 2.03	D.H.P.		
ccc	C9970-78 2.80	D.H.P.		
ccc	LN9830 2.12	CSIROLR262	100	1.40
130F	LN9829	CSIROLR262		
ccc	LN9816 1.99	CSIROLR261	100	1.37
130F	LN9815	CSIROLR261		

PROXIMATE wt % ad

Sample type	M	A	V.M	F.C
ccc	4.0	17.7 db / 18.4 daf	28.1 daf	49.6 daf / 63.4 daf
ccc	3.6	10.5 db / 10.9 daf	31.7 daf	54.2 daf / 63.1 daf
130F	4.0	1.6 db / 1.7 daf	36.1 daf	58.3 daf / 61.7 daf
ccc		31.2		
ccc		23.4		
ccc		21.3		
ccc	2.2	11.5 db / 11.9 daf	32.3 daf	49.0 daf / 63.1 daf
130F	2.0	3.7 db / 3.8 daf	37.6 daf	56.7 daf / 60.1 daf
ccc	1.8	14.0 db / 14.5 daf	33.6 daf	50.4 daf / 63.9 daf
130F	2.0	2.0 db / 2.0 daf	36.2 daf	59.8 daf / 62.3 daf

ULTIMATE wt % ad

Sample type	C	H	O	N	S
ccc	69.7	4.1	7.0 daf / 8.4 daf	1.2	0.3 / 0.4
ccc	71.1	4.5	8.5 daf / 9.8 daf	1.4	0.4
130F	78.5	5.1	8.8 daf / 9.5 daf	1.5	0.5
ccc	68.1	4.2	8.5 daf / 9.8 daf	1.3	0.4
130F	77.2	6.2	9.4 daf / 10.2 daf	1.5	0.6
ccc	68.1	4.6	6.6 daf / 8.4 daf	1.7	0.3
130F	79.4	5.3	7.7 daf / 9.4 daf	2.0	0.4
ccc	70.6	4.7	6.6 daf / 8.4 daf	1.8	0.5
130F	81.0	5.2	7.1 daf / 9.2 daf	2.1	0.6

Sample type	SE MJ/kg	CSN
ccc	26.56 daf / 33.41	1
ccc	29.19 daf / 33.98	1½
130F	32.42 daf / 34.36	5½
ccc	16.93 daf / 36.33	
ccc	22.37 daf / 32.90	
ccc	20.90 daf / 32.24	
ccc	28.29 daf / 34.80	6
130F	33.12 daf / 35.12	6
ccc	29.31 daf / 34.82	7½
130F	33.77 daf / 35.17	7

MINOR wt % ad

Sample type	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
ccc	0.32 daf / 0.41	0.09 daf / 0.11	0.23 / 0.28	0.003		0.03	5	0.03
ccc	0.46 daf / 0.54	0.09 daf / 0.11	0.45 / 0.52	0.003		0.08	2	0.01
130F	0.52 daf / 0.55	0.02 daf / 0.02	0.50 / 0.53	0.001		0.06		0.02
ccc	0.27 daf / 0.34			0.015				
ccc	0.41 daf / 0.54			0.048				
ccc	0.33 daf / 0.52			0.047				
ccc	0.32 daf / 0.39	0.02 daf / 0.02	0.30 / 0.37	0.016		0.01	2	0.03
130F	0.42 daf / 0.45	0.01 daf / 0.01	0.41 / 0.44	0.002		0.00		0.06
ccc	0.50 daf / 0.59	0.02 daf / 0.02	0.48 / 0.57	0.013		0.01	2	0.05
130F	0.64 daf / 0.67	0.05 daf / 0.05	0.59 / 0.61	0.048		0.00		0.22

ASH

Sample type	SiO_2 %	Al_2O_3 %
ccc	66.0 / 29.1	23.0 / 1
ccc	60.0 / 2.0	30.3
ccc	73.1	18.4
ccc	74.5 / 4.5	18.4 / 1
ccc	61.6 / 2.3	27.0 / 1

TRACE

Sample type	B ppm ad	Ga ppm ad
ccc	10	4
130F	30	3
ccc	50	5
ccc	60	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Belmont
Belmont North Belltop and John Darling Collieries

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Swansea
Wallamaine and Normaine Collieries

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Wallarah (Upper Split) seam	13.00 – 15.72		2.72	LR275
Wallarah (Lower Split) seam	15.00 – 16.97		1.97	LR279
Great Northern seam	25.00 – 27.92		2.92	CSIRO LR283

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
ccc	LN10462 2.69	CSIRO LR275 LR275	100	23 25	19 21	53 57	8
ccc	LN10635 1.97	CSIRO LR279 LR279	100	27 28	21 22	44 50	3
ccc	LN11306 2.81	CSIRO LR283 LR283	100	44 47	14 15	35 38	7

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN10462 2.69	CSIRO LR275 LR275	100	1.43
130F	LN10461	CSIRO LR275 LR275		
ccc	LN10635 1.97	CSIRO LR279 LR279	100	1.42
130F	LN10634	CSIRO LR279 LR279		
ccc	LN11306 2.81	CSIRO LR283 LR283	100	1.44
130F	LN11305	CSIRO LR283 LR283		

PROXIMATE wt % ad

Sample type	M	A	V.M	F.C
ccc	3.8	13.3 db / 15.6 daf	27.3 daf	55.6 daf / 63.0 daf
130F	4.1	1.4 db / 1.9 daf	35.8 daf	57.3 daf / 60.9 daf
ccc	3.2	14.3 db / 14.8 daf	28.6 daf	53.9 daf / 64.5 daf
130F	3.5	3.2 db / 3.4 daf	37.2 daf	52.1 daf / 60.1 daf
ccc	3.3	18.9 db / 19.5 daf	29.0 daf	48.8 daf / 62.7 daf
130F	3.1	2.1 db / 2.2 daf	38.2 daf	56.6 daf / 59.8 daf

ULTIMATE wt % ad

Sample type	C	H	O	N	S
ccc	69.1	4.1	8.1 daf / 9.8 daf	1.3	0.3
130F	78.1	5.0	8.3 daf / 9.4 daf	1.5	0.4
ccc	68.1	4.2	8.5 daf / 9.8 daf	1.3	0.4
130F	77.2	6.2	9.4 daf / 10.2 daf	1.5	0.6
ccc	66.8	4.1	7.2 daf / 9.2 daf	1.3	0.4
130F	78.8	5.3	8.7 daf / 9.6 daf	1.8	0.6

Sample type	SE MJ/kg	CSN
ccc	27.68 daf / 35.38	1
130F	32.10	5½
ccc	27.40 daf / 33.22	1
130F	31.80 daf / 34.10	4½
ccc	24.24 daf / 33.12	1
130F	32.45 daf / 34.19	5½

MINOR wt % ad

Sample type	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
ccc	0.29 daf / 0.35	0.06 daf / 0.07	0.23 / 0.28	0.003		0.10	3	0.02
130F	0.40 daf / 0.43	0.05 daf / 0.05	0.35 / 0.38	0.004		0.05		0.06
ccc	0.40 daf / 0.48	0.04 daf / 0.06	0.36 / 0.43	0.019		0.06	2	0.07
130F	0.52 daf / 0.63	0.02 daf / 0.02	0.50 / 0.61	0.001		0.06		0.05
ccc	0.46 daf / 0.59	0.10 daf / 0.13	0.36 / 0.46	0.005		0.04	14	0.92
130F	0.53 daf / 0.56	0.01 daf / 0.01	0.52 / 0.55	0.001		0.03		0.06

ASH

Sample type	SiO_2 %	Al_2O_3 %
ccc	62.1 / 1.8	34.7 / 1
ccc	55.2 / 1.4	40.3 / 1
ccc	60.9 / 3.1	19.6 / 1

TRACE

Sample type	B ppm ad	Ga ppm ad
ccc	25	15
ccc	40	3
ccc	80	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Newcastle
Waratah No 2 and Burwood Collieries

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Newcastle
Waratah No 2 Burwood Collieries

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

Newcastle Coal Measures

Wavehill seam — 70.00 / 46 / 71.84 — 1.84 — CSIROLR253
Upper Fern Valley seam — measured Bog Tunnel Redwood Beach 17/3/82
Lower Fern Valley seam — 90.00 — 4.06 — CSIROLR257
Victoria Tunnel seam — 88 — 2.19 — CSIROLR258
Nobbys seam — 129.00
Dudley seam — 83 — 1.93 — CSIROLR259
Yard seam — 124.93
Borehole seam — 45.00 / 87 / 47.08 — 2.08 — CSIROLR259

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	V+C	Vi+CD+DC	I	SC+MM
ccc	LN9204 1.64	CSIROLR253	100	85	3 mmf 4	2 2	10
ccc	LN9489 1.98	CSIROLR257	100	79 63	8 mmf 9	8 8	5
ccc	LN9661 1.79	CSIROLR258	100	71 76	12 mmf 13	10 11	7
ccc	LN9704 2.04	CSIROLR259	100	90 82	10 mmf 10	8 8	2

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 % ad	Al_2O_3 % ad	TRACE: B ppm ad	Ga ppm ad
ccc	LN9204 1.64	CSIROLR253	100	1.42	3.4	20.0	30.6	46.0	68.4	4.3	7.3	1.4	0.2	26.21	4	0.26	0.06	0.20	0.002		0.00	0	0.20	74.0	17.9	40	2
						20.7	40.0	46.0	82.8	5.6	9.4	1.9	0.3	34.22		0.34	0.08	0.26						4.1	1		
ccc	LN9489 1.98	CSIROLR257	100	1.39	3.2	15.5	32.1	49.2	67.8	4.5	7.1	1.6	0.3	28.03	5*	0.25	0.03	0.30	0.033		0.01	41	0.75	49.1	15.2	30	3
						18.0	39.5	40.5	83.5	5.5	8.6	2.0	0.4	34.49		0.41	0.04	0.37						4.5	1		
+30F	LN9542			2.5	3.4	35.4	58.7		78.9	5.1	7.6	1.9	0.4	32.61	5*	0.37	0.00	0.37	0.016		0.02	200	0.18				
					3.5	37.4	62.6		83.5	5.1	7.7	1.9	0.4	34.68		0.39	0.00	0.39									
ccc	LN9661 1.79	CSIROLR258	100	1.36	2.5	13.1	34.1	50.6	70.7	4.9	6.7	1.9	0.4	29.49	6	0.40	0.03	0.37	0.009		0.01	4	0.17	45.9	25.0	50	25
						15.4	40.3	54.7	83.5	5.8	8.1	2.2	0.4	34.80		0.47	0.04	0.41						2.6	1		
+30F	LN9640			2.3	3.7	38.5	57.8		79.7	5.4	7.4	2.2	0.4	32.47	6	0.48	0.06	0.42	0.052		0.01		0.06				
					3.8	40.9	55.3		83.7	5.7	7.9	2.3	0.4	34.52		0.45	0.00	0.45									
ccc	LN9704 2.04	CSIROLR259	100	1.30	2.4	6.2	36.6	54.8	76.6	5.2	7.2	2.0	0.4	31.87	7*	0.46	0.08	0.38	0.046		0.02	<1	0.86	46.1	27.6	40	2
						6.4	40.7	54.9	83.9	5.6	7.9	2.2	0.4	34.87		0.44	0.02	0.42						1.7	1		
+30F	LN9588			2.7	3.1	38.8	55.6		80.0	6.4	6.7	2.2	0.4	32.91	7	0.44	0.01	0.43	0.038		0.03		0.08				
					3.2	41.0	55.9		85.0	5.7	6.5	2.3	0.5	34.94		0.47	0.01	0.46									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Somerset
Longley DDH 1

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Somerset
Longley DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

Newcastle Coal Measures

Vales Point Upper seam — 903.98 / 904.36 / 927.38
Vales Point Lower seam / Wallarah seam — 45 — 2.78
Great Northern Upper seam — 6 — 1.44 — JCB
Great Northern Middle and Lower seams — 933.78 / 938.20
Fassifern Upper and Middle seams — 940.74 / 944.64 / 955.46 / 955.60 / 962.46 / 962.56 / 963.03
Fassifern Lower seam — 963.62 / 964.74 / 964.98 / 967.12
?Upper Pilot seam — 968.36 / 976.91 / 977.47 / 977.89
?Lower Pilot seam — 980.62 / 983.54 / 992.43 / 1000.94 / 1002.32

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	V+C	Vi+CD+DC	I	SC+MM
Cor	PN5045 - 5055 2.78	CSIRO1R583R		32 35	22 mmf 25	42 34	4
PCC	PN5055 - 5060 1.44			1 2	7 mmf 8	76 90	16

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max
Sub	PN5051	CSIRO1R583R	0.98

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wl %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 % ad	Al_2O_3 % ad	TRACE: B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Teralba
Northern, Northern Extd and Stockton Borehole Collieries

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Teralba
Northern, Northern Extd and Stockton Borehole Collieries

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth m / mm	Section	Thickness	Source	MICROLITHOTYPE - VOL % Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	V+CD+DC	I	SC+MM	MACERAL - VOL % Sample type	Sample number – thickness analysed	Source	Recovery or wt %	V+E	I	MM	REFLECTANCE Sample type	Sample Number	Source	R_o max
Great Northern Seam	27.00 – 41 – 32.01		5.01	CSIRO LR237	CCC	LN8403 4.50	CSIRO LR236 CSIRO LR237	100	26 27	27 28	43 45	4											
Fassifern seam	32.01 – 58 – 37.43		2.43	CSIRO LR236	CCC	LN8385 2.10	CSIRO LR236	100	44 45	22 23	30 31	4											
Upper Pilot seam	61.05 – 102.78																						
Lower Pilot seam	126.72 – 134.11																						
Hartley Hill seam	139.57 – 145.64																						
Australasian seam	164.66 – 187.43																						
Montrose seam	188.65 – 193.80																						
Wavehill seam	199.36 – 200.45																						
Fern Valley (Upper) seam	218.24 – 227.46			BHP																			
Fern Valley (Lower) seam	235.41 – 236.50																						
Victoria Tunnel seam	267.54 – 275.76																						
Young Wallsend seam	281.00 – 82 – 285.46		2.46	CSIRO LR229	CCC	LN7878 2.32	CSIRO LR229	100	72 74	15 16	11 11	2											
Yard seam	289.69 – 291.08																						
Borehole seam	219.46 – 84 – 227.40		1.94	CSIRO LR227	CCC	LN7742 1.70	CSIRO LR227 CSIRO LR229	100	72 75	17 17	9 4	2											

STRATIGRAPHY	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % od TS	P+S	D	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm od	Ga ppm od
Great Northern Seam	CCC	LN8403 4.50	CSIRO LR237	100	1.43	2.7	15.0 gb 15.4	29.1 daf 36.3	53.2 64.7	68.2 82.9	4.2 5.1	8.1 daf 9.8	1.4 1.8	0.4 0.4	27.80 daf 33.80	1	0.58 0.46	0.10 daf 0.12	0.28 0.34	0.005		0.01	2	0.46	60.6 2.1	28.2 1	60	6
Fassifern seam	CCC	LN8385 2.10	CSIRO LR236	100	1.44	2.9	17.7 gb 18.2	29.6 daf 37.3	49.8 62.7	66.2 83.3	4.1 5.2	7.3 daf 9.3	1.4 1.7	0.4 0.5	26.87 daf 33.87		0.42 0.53	0.06 daf 0.08	0.36 0.45	0.004		0.01	2	0.32	67.8 2.9	23.1 1	70	4
Upper Pilot seam																												
Lower Pilot seam																												
Hartley Hill seam																												
Australasian seam																												
Montrose seam																												
Wavehill seam																												
Fern Valley (Upper) seam																												
Fern Valley (Lower) seam																												
Victoria Tunnel seam																												
Young Wallsend seam	CCC	LN7878 2.32	CSIRO LR229	100	1.39	2.6	16.4 16.8	31.5 daf 38.4	44.5 vitrain 54.1	67.8 83.7	4.5 5.6	6.7 daf 8.2	1.7 analysis 2.1	0.3 0.4	27.91 daf 34.45	6%	0.36 0.44	0.03 daf 0.04	0.34 0.42	0.062		0.00	3	0.36	67.8 2.2	21.5 1	70	7
	1.50F	LN7877				2.8	2.1 2.2	33.1 daf 34.8	62.0 vitrain 65.2	79.6 analysis 83.6	5.0 5.3	8.2 daf 8.6	2.0 2.1	0.4 0.4	32.84 daf 34.51	4%	0.42 0.44	0.00 daf 0.00	0.42 0.44	0.008		0.01		0.04				
Yard seam																												
Borehole seam	CCC	LN7742 1.70	CSIRO LR227	100	1.34	2.6	9.8 10.1	39.6 daf 39.5 vitrain	53.0 60.5	73.3 83.7	4.9 5.6	7.1 daf 8.0	1.8 2.1 analysis	0.5 0.6	30.40 daf 34.70	7	0.50 0.57	0.01 daf 0.01	0.49 0.56	0.071		0.00	2	0.18	59.0 1.8	30.0 1	60	3
	1.30F	LN7738				2.7	2.8 2.9	34.3 daf 38.4	58.2 vitrain 61.6	79.8 analysis 84.4	5.2 5.5	6.9 daf 7.4	2.0 2.1	0.5 0.6	32.98 daf 34.89	6%	0.52 0.55	0.00 daf 0.00	0.43 0.55	0.068		0.01		0.10				

0

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Vales Point
South Wallarah DDH2 and Newvale No1 Colliery

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Vales Point
South Wallarah DDH 2 Newvale No 1 Colliery

PETROGRAPHIC ANALYSES — MACROSCOPIC — MICROLITHOTYPE - VOL % — MACERAL VOL % — REFLECTANCE

STRATIGRAPHY	Depth m / Vit % / mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Newcastle Coal Measures	152.03																						
Wallarah seam	133.28		1.22																				
	200.00																						
Great Northern seam	71		2.72	CSIRO LR348	ccc	LN21393 – 2.47			56 / 60	20 / 21	18 / 19	6											
	202.72																						
	210.54																						
Pfassifern seam			2.64																				
	213.18																						
	216.50		0.64																				
	217.14			CSIRO LR37																			

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: West Wallsend
B.H.P. Stockton Borehole DDH 2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: West Wallsend
B.H.P. Stockton Borehole DDH 2

PETROGRAPHIC ANALYSES — MACROSCOPIC — MICROLITHOTYPE - VOL % — MACERAL - VOL % — REFLECTANCE

STRATIGRAPHY	Depth m / Vit % / mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Newcastle Coal Measures	11.86																						
	13.64																						
	20.96																						
	24.69																						
	58.50		1.89																				
	74.34																						
	77.55																						
	112.20		2.14	CSIRO LR185																			
	114.34																						
	115.33																						
	121.18																						
	122.36																						
	122.96																						
	132.98		0.65																				
	135.00																						
	161.95																						
	164.82																						
Young Wallsend seam	213.84		2.75																				
	216.54																						
Yard seam	243.89		0.36																				
	244.25																						
Borehole seam	248.13		2.24																				
	250.37																						

CHEMICAL ANALYSES — PROXIMATE wt % ad — ULTIMATE wt % ad — MINOR wt % ad — ASH — TRACE

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc	LN422 – 1.17	CSIROLR348	95	1.43	3.5	13.8 db / 14.3	28 daf / 33.9	54.6 / 46.1	69.3 / 83.7	4.1 / 5.0	7.8 daf / 9.4	1.2 / 1.5	0.3 / 0.4	27.98 daf / 33.82	1	0.37 daf / 0.39			0.005								
ccc	LN21393 – 2.47		100	1.37	2.9	10.4 db / 10.7	33.0 daf / 38.0	53.7 / 62.0	72.3 / 83.3	4.6 / 5.2	7.9 daf / 9.3	1.5 / 1.7	0.4 / 0.4	29.42 daf / 33.94	2	0.38 / 0.44	0.00 daf / 0.00	0.38 / 0.44	0.007		0.04	41	0.70	57.1 / 2.1	26.4 / 1.1	50	3
ccc	LN424 – 2.25		90	1.49	2.4	21.5 db / 22.0	28.8 daf / 35.2	49.3 / 44.8	63.6 / 83.6	3.9 / 5.1	6.9 daf / 9.1	1.3 / 1.7	0.4 / 0.5	25.61 daf / 33.65	1	0.41 daf / 0.54			0.026								
A	LN392 – 0.64		95	1.58	2.5	29.2 db / 29.4	22.4 daf / 32.8	45.9 / 47.2						22.89 daf / 33.49		0.50 / 0.51												
																0.42											
																0.22											
																0.54											
																0.45											
																0.57											
																0.44											
																0.51											
ccc	LN4635 – 2.01	CSIRO LR185	95	1.48	3.1	24.6 db / 25.4	28.9 daf / 40.0	43.4 / 60.0						24.31 daf / 33.61	1	0.45 daf / 0.62			0.009								
tccc	LN4651 – 1.87		95		2.9	21.0 db / 21.6	29.4 daf / 38.4	44.7 / 61.4	63.6 / 83.5	4.3 / 5.6	6.5 daf / 8.7	1.4 / 1.8	0.3 / 0.4	25.95 daf / 34.05	2½	0.31 / 0.41	0.01 daf / 0.01	0.30 / 0.40	0.067		0.04	2	0.24					
us	LN4731 – 0.65		95	1.53	2.4	30.6 db / 31.4	24.0 daf / 35.8	45.0 / 64.2						22.79 daf / 34.03	1	0.32 daf / 0.48			0.018								
ls	LN4734 – 0.47		95	1.44	2.9	19.8 db / 20.4	26.7 daf / 34.5	50.6 / 65.5						26.21 daf / 33.91	2	0.38 daf / 0.49			0.013								
ms	LN4669 – 1.99		90		3.3	17.2 db / 17.8	30.2 daf / 38.0	49.3 / 62.0	66.1 / 83.2	4.4 / 5.5	7.0 daf / 8.7	1.8 / 2.3	0.2 / 0.3	27.14 daf / 34.12	3½	0.27 / 0.34	0.01 daf / 0.01	0.26 / 0.33	0.012		0.04	<1	0.41					
ls	LN4685 – 0.36		95	1.37	3.4	10.6 db / 11.0	31.9 daf / 37.1	54.1 / 62.9						29.83 daf / 34.47	3	0.34 daf / 0.40			0.008								
ms	LN4705 – 1.66		95	1.34	3.1	4.4 db / 9.7	35.0 daf / 40.0	52.5 / 60.0	78.2 / 83.6	5.0 / 5.7	7.8 daf / 8.5	1.7 / 2.0	0.3 / 0.4	30.12 daf / 34.42	5	0.37 / 0.42	0.08 daf / 0.09	0.29 / 0.33	0.044		0.04	<1	0.36					

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Chain Valley
Wallarah Colliery

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Mannering Park
South Wallarah DDH 3 Wyee State Coal Mine

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
Newcastle C.M.	90.00				ccc	LN9932	CSIRO LR263	20	20	21	57	2
						5.03			20	21	59	
Wallarah seam	31		5.16	CSIRO LR263								
	95.16											

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
ccc	LN9932	CSIRO LR263	100	1.42	2.8	12.4	27.2	57.6	71.4	4.1	7.7	1.4	0.2	28.61	1
	5.03				db	12.8	daf 32.1	67.9	84.3	4.9	daf 8.8	1.7	0.3	daf 33.75	
							vitrain analysis								
130F	LN9930				3.6	2.7	36.6	57.1	78.4	5.1	12.3	1.5	0.4	32.19	6
					db	2.8	daf 39.1	60.9	83.7	5.5	daf 8.8	1.6	0.4	daf 34.36	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.25	0.02	0.23	0.004		0.00	0	0.45
	daf 0.02	daf 0.27					
0.24							
0.40	0.00	0.40	0.02		0.10		0.12
	daf 0.00	daf 0.43					

ASH

SiO_2 %	Al_2O_3 %
55.1	34.5
16	1.1

TRACE

B ppm ad	Ga ppm ad
15	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Awaba
Awaba State Mine

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Awaba
Awaba State Mine

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
Great Northern seam	30.00				ccc	LN9854	CSIRO LR246	100	32	10 daf 22	41	7
	45		3.63	CSIRO LR246		3.40			34		44	
	33.45											

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: West Wallsend
Mt. Sugarloaf and Stockrington No2 Collieries

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: West Wallsend
Mt. Sugarloaf and Stockrington No2 Collieries

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
Newcastle Coal Measures	80.00				'is'	LN8665	CSIRO LR243	31	27 daf 28	39	3	
↑ Great Northern Seam	46		2.57	CSIRO LR243		2.57		32		40		
	82.57											
	120.00				ms	LN10005	CSIRO LR266	100	60	20 daf 21	15	5
Borehole seam	74		3.49	CSIRO LR266		2.55			63		16	
	123.49											

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
'is'	LN8665	CSIRO LR243	100	1.43	3.0	15.9	30.2	50.9	67.1	4.2	8.0	1.4	0.4	27.14	1
	2.57				db	16.4	daf 37.3	62.7	82.7	5.2	daf 10.0	1.7	0.4	daf 33.47	
ms	LN10006	CSIRO LR266	140	2.6		16.3	31.9	49.2	67.4	4.5	7.1	1.6	0.5	27.77	3.4
	2.55				db		daf				daf			daf	
					lb 7		34.3	60.7	83.2	5.5	8.7	2.0	0.6	34.29	
									vitrain analysis						
130F	LN10004				2.8	2.5	36.3	58.4	79.3	5.2	7.8	1.9	0.6	32.91	5.2
					db		daf				daf			daf	
					2.6		38.3	61.7	85.7	5.5	8.2	2.0	0.6	34.75	

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.38	0.08	0.30	0.004		0.00	2	0.12
0.41	daf 0.10	daf 0.32					
0.46	0.08	0.40	0.039		0.00	3	0.26
0.54	daf 0.10	daf 0.44					
0.56	0.02	0.56	0.015		0.00		0.17
0.59	daf 0.02	daf 0.57					

ASH

SiO_2 %	Al_2O_3 %
51.5	26.9
2.1	1.1
64.2	28.1
2.5	1.1

TRACE

B ppm ad	Ga ppm ad
50	5
70	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Wyong
Elecom Wyong DDH 10

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Wallarah seam	504.73		0.23	CSIRO LR363
	504.96 (34)			
	519.21			
Great Northern seam	34		5.24	
	824.45			
	604.73			
Fassifern seam	72		7.42	
	611.15			

Newcastle Coal Measures

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
CCC	LN22850	CSIRO LR363	93	59	24 daf	14	3
C	0.23			61	25	14	
CCC	LN22740		98	21	20	52	7
	4.53			23	22	55	
CCC	LN22745		98	51	14	16	19
	2.21			63	17	20	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
CCC	LN22850	CSIRO LR363	93	2.9
C	0.23			
CCC	LN22740		98	2.2
	4.53			
CCC	LN22745		98	1.9
	2.81			

PROXIMATE wt % ad

M	A	VM	FC
8.1 db 8.3	37.1 daf 36.5	56.9 63.5	
2.5	16.9 db 17.3	26.3 daf 32.6	54.4 67.4
1.9	22.4 db 22.8	27.7 daf 36.5	48.1 63.5

ULTIMATE wt % ad

C	H	D	N	S
76.1 85.0	4.8 5.4	6.8 daf 7.6	1.5 1.6	0.4 0.4
68.2 84.4	4.0 4.9	7.2 daf 8.8	1.2 1.5	0.5 0.4
64.3 84.9	4.1 5.4	5.6 daf 1.8	1.3 1.8	0.8 0.6

SE MJ/kg	CSN
31.31 daf 34.94	
27.54 daf 34.05	1
26.63 daf 35.12	7

MINOR wt % ad

S TS	S P+S	S D	P	F	Cl	As ppm	CO_2
0.37 0.41	0.01 daf 0.01	0.36 0.40	0.002		0.01	1	0.01
0.33 0.41	0.02 daf 0.02	0.31 0.39	0.006		0.01	41	1.58
0.48 0.63	0.03 daf 0.03	0.46 0.61	0.023		0.04	1	0.86

ASH

SiO_2 %	Al_2O_3 %
51.8	27.5
14	1.5
79.7	10.1
7.9	1.1

TRACE

B ppm ad	Ga ppm ad
8	20
8	5
40	16

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Wakefield
Newstan Deep Bore DDH1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Great Northern seam	10.24		4.42	CSIRO LR76
	14.66			
Fassifern seam	42.52		1.16	
	43.68			
?Upper Pilot seam	48.27		0.61	
	48.88			
?Lower Pilot seam	101.29		0.36	
	101.65			
	125.16		0.58	
Australasian seam	125.78			
	129.01		0.45	
	129.46			
Montrose seam	139.80		0.92	
	140.72			
Wavehill seam	150.10		0.97	
	151.05			
	166.59		1.02	
	167.61			
	198.93			
Fern Valley seam	199.95		1.02	
	201.29		1.79	
	203.08			
	250.71			
	251.22			
Victoria Tunnel seam	262.19		0.44	
	262.63			
	263.65		0.33	
	263.98			
	274.19			
Young Wallsend seam			3.50	
	277.69			
	279.03			
Borehole seam			1.71	
	280.73			

Newcastle Coal Measures

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
CCC	LN1503	CSIRO LR76	~70	1.49
	3.61			
CCC	LN1445		82	1.54
	0.98			
WS	LN1449		96	1.57
	0.69			
IS	LN1450		96	1.36
	0.36			
US	LN1452		81	1.44
	0.58			
IS	LN1455		78	1.61
	0.45			
WS	LN1456		82	1.52
	0.92			
WS	LN1457		96	1.53
	0.62			
WS	LN1495		58	1.47
	0.74			
MS	LN1402		~88	1.53
	0.80			
IS	LN1404		~89	1.52
	1.62			
US	LN1460		90	1.64
	0.44			
MS	LN1461		65	1.57
	0.27			
CCC	LN1496		~90	1.42
	2.97			
CCC	LN1418		65	1.41
	1.71			

PROXIMATE wt % ad

M	A	VM	FC
3.7	28.2 db 21.0	25.6 daf 35.2	49.3 64.8
3.7	28.2 db 29.3	25.6 daf 37.6	42.5 62.4
3.2	32.9 db 33.4		
3.5	12.6 db 13.1	32.5 daf 38.1	51.4 61.3
2.6	23.4 db 24.0	31.7 daf 42.9	42.3 57.1
2.8	17.1 db 17.6	33.0 daf 41.1	47.3 58.9
2.8	28.3 db 29.1	28.0 daf 40.6	40.9 59.4
2.5	30.3 db 31.1		
3.1	21.3 db 22.0	29.1 daf 38.4	46.5 61.6
2.6	29.1 db 29.8	27.1 daf 39.4	41.3 60.4
2.8	29.1 db 29.9	28.4 daf 41.7	39.7 58.3
2.6	30.8 db 31.6		
2.6	14.9 db 15.3	32.6 daf 39.5	49.9 60.5
3.7	17.0 db 17.7	31.5 daf 39.4	49.5 60.6
2.5	33.3 db 34.9	32.8 daf 40.9	47.6 59.1

ULTIMATE wt % ad

C	H	D	N	S
62.9 82.8	3.3 4.3	8.3 daf 10.5	1.3 1.7	0.3 0.5
62.5 82.8	4.3 5.7	10.5 daf 13.8	1.7 2.2	0.5 0.7
66.7 83.4	4.4 5.5	6.8 daf 8.5	1.7 2.1	0.4 0.5
67.6 83.0	4.5 5.4	6.9 daf 9.2	1.4 1.9	0.4 0.5

SE MJ/kg	CSN
25.07 daf 32.96	1½
22.56 daf 33.10	1½
	1
28.75 daf 34.26	2
26.21 daf 34.10	1½
27.35 daf 34.08	2
23.14 daf 33.59	1
25.47 daf 33.66	1½
23.42 daf 34.19	1
23.17 daf 34.01	1½
28.10 daf 34.03	3½
27.26 daf 34.05	4
27.46 daf 34.01	

MINOR wt % ad

S TS	S P+S	S D	P	F	Cl	As ppm	CO_2
0.34 0.45	0.01 daf 0.01	0.33 0.43					
0.38 daf 0.56							
0.45 daf 0.64							
0.41 daf 0.55							
0.48 daf 0.65							
0.47 daf 0.68							
0.35 daf 0.46							
0.32 daf 0.47							
0.36 daf 0.53							
0.48							
0.49 daf 0.68							
0.40 0.50	0.02 daf 0.02	0.38 0.48					0.33
0.40 0.49	0.04 daf 0.05	0.36 0.44					0.06

ASH

SiO_2 %	Al_2O_3 %
33.8	

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Mannering Park
South Wallarah DDH 3 and Wyee State Mine DDH1

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE				
STRATIGRAPHY	Depth / Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vi+Cd+Dc	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Newcastle Coal Measures																							
Wallarah seam	136·70		1·20	CSIRO LR36																			
	137·90																						
	174·66		2·67																				
Great Northern seam																							
	182·55																						
	19·67		3·99	CSIRO LR368	ccc	LN23614 3·75	CSIRO LR368	~90	29 33	23 26	36 41	12											
Fassifern seam	46																						
	21·66																						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc	LN425 1·03	CSIRO LR36		1·46	3·4	17·4 db 18·0	27·2 daf 34·3	52·0 daf 65·7	66·0 83·2	4·0 5·0	7·5 daf 9·4	1·3 1·6	0·4 0·5	26·47 daf 33·40	1	0·39 db 0·49										
ccc	LN426 1·07			1·44	3·2	17·4 db 18·0	29·2 daf 36·8	50·2 daf 63·2	66·1 83·3	4·2 5·5	7·4 daf 9·4	1·3 1·6	0·4 0·4	26·87 daf 33·84	1	0·35 db 0·44										
ccc	LN25829 3·75	CSIRO LR368	~90	1·49	3·0	21·1 db 21·8	27·9 daf 34·8	48·0 daf 63·2	65·2 85·3	3·9 5·2	7·1 daf 9·5	1·3 1·7	0·4 0·5	25·52 daf 33·66	2	0·38 db 0·50	0·01 daf 0·01	0·37 0·49	0·000		0·02	1	1·66	62·7 35	18·0 :1	80	5

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Wakefield
Newstan No1 Colliery and Newstan Deep Bore DDH2

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE				
STRATIGRAPHY	Depth / Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vi+Cd+Dc	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Newcastle Coal Measures																							
Great Northern seam	50·00																						
	45		4·56	CSIRO LR251	ccc	LN9067 4·26			27 30	24 29	37 41	10											
	54·56																						
	36·61																						
Fassifern seam			2·52																				
	41·33																						
	44·85		0·61																				
	45·92																						
	102·51																						
	105·37																						
	121·26																						
	121·69																						
	122·43		1·62																				
	124·06																						
	125·38		0·65																				
	126·03																						
	146·92		0·91	CSIRO LR 162																			
	146·85																						
	191·06																						
	191·21																						
	157·69		0·86																				
	158·55																						
	229·01		1·34																				
	230·35																						
	230·94		0·91																				
	231·41																						
	246·77		1·54																				
	247·31																						
	275·99		2·05																				
Young Wallsend seam	278·04																						
	299·97		0·63																				
Borehole seam	300·76																						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc	LN9067 4·26	CSIRO LR251	100	1·45	3·5	18·4 db 19·1	27·4 daf 35·1	50·7 daf 64·9	65·1 83·4	4·0 5·2	7·4 daf 9·3	1·3 1·7	0·3 0·4	24·24 daf 33·61	1	0·55 db 0·45	0·08 daf 0·08	0·29 0·37	0·048		0·00	4	0·12	60·9 2·1	24·2 :1	70	6
ccc	LN2848 2·11		~95	1·50	3·7	23·5 db 24·4	24·5 daf 33·6	48·3 daf 66·4	57·4 78·8	3·3 4·6	10·6 daf 14·4	1·2 1·7	0·3 0·5	24·37 daf 33·47	1	0·34 db 0·47			0·003				0·38				
ccc	LN 2905 0·67		~95	1·45	3·1	18·8 db 19·4	26·2 daf 33·6	51·9 daf 66·4						24·14 daf 33·49	1	0·50 db 0·64											
ccc	LN2918 1·61		~83	1·45	3·2	21·5 db 22·2	28·3 daf 37·6	47·0 daf 62·4						25·77 daf 34·22	1	0·44 db 0·58											
ccc	LN2921 0·88		~87	1·46	3·9	24·4 db 25·1	27·6 daf 38·1	45·1 daf 61·9						24·86 daf 34·24	1	0·42 db 0·58											
ws	LN2924 0·91	CSIRO LR 162	~87	1·48	3·4	31·6 db 32·7	21·7 daf 38·0	40·3 daf 62·0						21·91 daf 33·78	1	0·46 db 0·72											
ccc	LN2926 0·86		~81	1·54	2·8	30·1 db 31·0	26·1 daf 38·9	41·0 daf 61·1						22·98 daf 34·24	1	0·36 db 0·54											
ws	LN2931 0·97		~85	1·40	2·0	35·8 db 36·6	25·9 daf 41·6	36·3 daf 58·4						20·61 daf 33·15	1	0·29 db 0·47											
ccc	LN2941		~86	1·68		27·3										0·48											
ccc	LN2996 1·87				2·5	20·4 db 20·9	28·4 daf 37·0	48·7 daf 63·0	64·1 83·0	4·3 5·5	7·0 daf 9·0	1·6 2·1	0·3 0·4	26·26 daf 33·98	3	0·37 db 0·48	0·03 daf 0·04	0·34 0·44	0·167		0·04	2	0·36					
ds	LN2958			1·36	2·2	10·6 db 10·8	33·4 daf 38·3	53·8 daf 61·7						29·75 daf 34·12	6	0·51 db 0·58											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE COAL MEASURES
LOCATION: Wakefield
Newstan No1 Colliery and Newstan Deep Bore DDH2

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc	LN2941 0·97	CSIRO LR 162	~85	1·40	2·0	35·8 db 36·6	25·9 daf 41·6	36·3 daf 58·4						20·61 daf 33·15	1	0·29 db 0·47											
ccc	LN2941		~86	1·68		27·3										0·48											
ccc	LN2996 1·87				2·5	20·4 db 20·9	28·4 daf 37·0	48·7 daf 63·0	64·1 83·0	4·3 5·5	7·0 daf 9·0	1·6 2·1	0·3 0·4	26·26 daf 33·98	3	0·37 db 0·48	0·03 daf 0·04	0·34 0·44	0·167		0·04	2	0·36					
ds	LN2958			1·36	2·2	10·6 db 10·8	33·4 daf 38·3	55·8 daf 61·7						29·75 daf 34·12	6	0·51 db 0·58											

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Warkworth
Warkworth Bore R2, Wambo Open Cut and ARMCO Bulga DDH 71

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Warkworth
Warkworth Bore R2, Wambo Open Cut and ARMCO Bulga DDH 71

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Whybrow Seam	78		3.30	CSIRO LR582R
Redbank Creek Seam				
Wambo Seam	75		2.44	CSIRO LR389
	14.12		1.83	
	15.95			
	58.24		2.09	CSIRO LR151
	60.33			
	69.37		1.32	
	70.69			
	113.63		.92	
	114.55			
	126.24		.84	
	127.08			
	151.87		1.83	
	153.70			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD-DC	I	SC+MM
CCC	LN35705 3.30	CSIRO LR582R		63 69	15 17	13 14	9
FC	LN39012	CSIRO LR389		31	14	11	24
CCC	2.44 LN39011			67 62	18 14	15 14	5
WS	1.72			65	20	15	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
WS	LN39012	CSIRO LR389		1.54
FC	2.44			
CCC	LN39011			1.34
WS	1.72			
CCC	LN1780	CSIRO LR151		1.54
WS	1.05			
FC	LN1786			1.40
WS	1.85			
CCC	LN1787			1.39
WS	1.32			
CCC	LN1788			1.39
WS	0.64			
CCC				1.50
WS	1.00			
CCC	LN1794			1.42
WS	1.80			

PROXIMATE wt % ad

M	A	VM	FC
2.9	25.9 db 26.7 daf	21.9 39.2	49.3 60.8
2.9	8.4 db 8.8 daf	33.4 37.6	55.4 62.4
2.6	20.6 db 21.1 daf	30.8 40.1	44.0 59.9
2.3	12.8 db 13.9 daf	33.2 39.1	51.7 60.9
2.1	10.6 db 10.9 daf	34.2 38.1	53.2 59.2
1.9	12.9 db 13.1 daf	33.1 38.8	52.1 51.2
2.0	25.1 db 25.6 daf	28.5 39.1	44.4 60.9
2.0	14.3 db 14.6 daf	30.7 36.7	53.0 63.3

ULTIMATE wt % ad

C	H	O	N	S
72.6	4.6	9.4 daf 10.4	1.6 1.8	0.4 0.5

SE MJ/kg	CSN
23.63 daf 32.62	
29.82 daf 33.41	2.5
25.56 daf 33.24	1
28.70 daf 35.61	2
29.33 daf 33.54	1
29.21 daf 34.29	2
24.56 daf 33.70	1
29.90 daf 33.45	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.38 daf			0.006				
0.44	0.03	0.41	0.009				
0.50	0.03	0.47					
0.43 daf 0.56							
0.41 daf 0.48							
0.34 daf 0.39							
0.49 daf 0.58							
0.39 daf 0.54							
0.51 daf 0.61							

ASH

SiO_2 %	Al_2O_3 %
61.6	24.2
2.5	1.1
55.5	23.6
2.3	1.1

TRACE

B ppm ad	Ga ppm ad
15	10
15	5

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Ulan Lennox DDH 2 and 3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Ulan Lennox DDH 2 and 3

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
Goulburn seam	20.12		1.57	CSIROLR40
	21.69			
	29.11		2.34	CSIRO LR38
	31.50			
	35.56		3.86	
Ulan seam	35.92			
	40.91		4.99	
	41.91			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD-DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
LOR	LN861	CSIROLR40	24.5	1.60
LOR	LN808		30.1	1.53
US	LN893 1.97	CSIRO LR38		1.53
TS	LN892 3.19			1.41

PROXIMATE wt % ad

M	A	VM	FC
2.3	26.4 daf 27.0	30.6 daf 43.0	40.7 51.0
1.6	32.3 db 32.8	29.6 daf 44.8	36.5 55.2
2.4	27.8 db 28.5	26.2 daf 37.6	43.6 62.4
2.3	19.8 db 20.3	29.0 daf 36.8	49.9 63.2

ULTIMATE wt % ad

C	H	O	N	S
68.2	5.3	6.0 daf 8.0	1.2 1.5	0.4 0.5
66.5	4.2	6.3 daf 8.0	1.5 2.0	0.4 0.5

SE MJ/kg	CSN
24.36 daf 34.15	1
22.64 daf 34.27	1
23.61 daf 33.82	1
26.85 daf 34.03	1

MINOR wt % ad

S TS	S P+S	S O	P	F	Cl	As ppm	CO_2
0.48 daf 0.63							
0.42 daf 0.64							
0.42	0.09 daf 0.13	0.33	0.003		0.01		0.04
0.40	0.13	0.47					
0.39	0.05 daf 0.06	0.34	0.005		0.01		0.03
0.49	0.06	0.43					

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Nundah Bore A5 and Rixs Creek Bore DDH R4

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

Singleton Coal Measures

Rix's Creek seam

Dulwich seam

CSIRO LR154

CSIRO LR150

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vit+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

Sample type | Sample number – Thickness analysed | Source | Recovery or wt % | RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg | CSN

MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc	LN2645	CSIRO LR154	67		3.9	14.1 db	33.0 daf	49.0						27.99 daf		0.48 daf											
'is'	0.50					14.7	40.2	59.8						32.85		0.54											
ccc	LN2456		~70		4.0	15.2 db	33.5 daf	43.7						27.33 daf	3	0.55 daf											
'is'	1.39					16.6	41.8	58.5						33.60		0.74											
ccc	LN2459		76	1.39	3.6	11.7 db	35.9 daf	48.9						29.03 daf	3	0.48 daf											
'us'	0.76					13.1	42.3	57.7						34.24		0.57											
ccc	LN2461		50	1.44	3.6	10.4 db	33.7 daf	51.9						29.21 daf	2	0.55 daf											
'is'	0.50					11.3	34.1	60.6						34.15		0.64											
ccc	LN2462		~58	1.39	3.5	10.4 db	36.5 daf	49.6						29.70 daf	4	0.61 daf											
'us'	0.70					13.8	42.4	57.6						34.47		0.78											
ccc	LN2466		71	1.41	3.6	14.3 db	34.3 daf	47.8						27.87 daf	3½	1.59 daf											
'is'	0.65					14.9	41.7	58.3						32.41		1.85											
ccc	LN2471		80	1.38	3.5	13.7 db	35.0 daf	47.8						28.21 daf	3½	0.78 daf											
	1.33					14.2	42.3	57.7						34.05		0.91											
ccc	LN2475		67	1.47	3.4	13.6 db	34.3 daf	43.7						26.56 daf	3	0.61 daf											
'us'	0.56					15.3	44.0	56.0						34.06		0.98											
ccc	LN2678		64	1.46	3.4	8.2 db	36.2 daf	52.2						30.47 daf	5	0.62 daf											
is	0.41					8.9	40.9	59.1						34.47		0.70											
ccc	LN2679		66	1.41	3.2	11.8 db	35.1 daf	49.9						29.10 daf	4	0.54 daf											
'us'	0.55					12.2	41.2	58.8						34.22		0.64											
ccc	LN2684		78	1.44	3.4	14.9 db	33.4 daf	47.8						27.95 daf	3½	0.77 daf											
'is'	1.09					15.4	41.5	58.5						34.19		1.04											
ccc	LN2691		82	1.38	3.2	12.6 db	35.2 daf	49.0	69.3	5.1	7.6	1.6	0.4	28.73 daf	4	0.93 daf		0.012				1.06					
	1.69					13.0	41.8	58.2	82.5	6.1	9.0	1.9	0.7	34.12		0.99											
ccc	LN2695		74	1.39	3.4	13.1 db	34.9 daf	50.1	69.6	5.0	7.6	1.6	0.7	28.91 daf	3½	0.76 daf		0.006				0.49					
	0.95					12.6	40.7	59.3	82.4	5.9	8.4	1.9	0.9	34.22		0.88											
ccc	LN1748		17	1.38	3.1	13.2 db									1												
						15.0																					
ccc	LN1749		86	1.40	2.3	16.0 db	34.9 daf	46.8						27.90 daf	2½	0.43 daf											
'us'	1.07					16.4	42.7	57.3						33.49		0.77											
ccc	LN795	CSIRO LR150	78	1.42	3.1	18.1 db	31.7 daf	47.1						26.22 daf	1	0.40 daf		0.011									
'is'	0.99					18.7	40.2	59.8						33.24		0.51											
ccc	LN2002		~90		2.4	13.6 db	34.4 daf	49.6	69.5	4.9	7.7	1.4	0.5	28.47 daf	3½	0.54 daf	0.01 daf	0.53	0.010								
	2.81					15.9	40.4	59.1	82.7	5.9	9.1	1.7	0.6	33.89		0.64	0.01	0.63									
ccc	LN2003		~85		2.4	12.7 db	34.3 daf	50.6	70.2	5.0	daf		0.7	29.00 daf	5	0.68 daf		0.008									
	0.80					15.0	40.4	59.6	82.7	5.9				34.20		0.80											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Broke
Broke Prospecting Area Trial Shaft No 1 and 2

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source

Wittingham Coal Measures

CSIRO LR72

CSIRO LR90

MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+C; Vit+CD+DC; I; SC+MM

MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery or wt %; V+E; I; MM

REFLECTANCE: Sample type; Sample Number; Source; R_o max

CHEMICAL ANALYSES

Sample type | Sample number – Thickness analysed | Source | Recovery or wt % | RD

PROXIMATE wt % ad: M; A; VM; FC

ULTIMATE wt % ad: C; H; O; N; S

SE MJ/kg | CSN

MINOR wt % ad: S (TS; P+S; O); P; F; Cl; As ppm; CO_2

ASH: SiO_2 %; Al_2O_3 %

TRACE: B ppm ad; Ga ppm ad

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc		CSIRO LR72		1.38	2.5	12.2 db	32.0 daf	53.3						29.08 daf	2	0.59 daf											
'is'	1.09					12.8	37.5	62.5						34.08		0.99											
'is'					3.6	9.5 db	31.7 daf	55.4						29.93 daf		0.53 daf											
'us'	1.09					9.8	36.4	63.6						34.19		0.61											
ccc				1.40	2.3	17.0 db	32.9 daf	47.8						27.99 daf	4	0.45 daf											
'us'	0.72					17.4	40.8	59.2						34.08		0.56											
ccc				1.48	1.9	24.2 db	28.3 daf	45.6						25.03 daf	1	0.43 daf		0.005									
'us'	3.71		74		2.7	24.7 db	28.3 daf	47.0						33.87 daf		0.58 daf											
'is'	3.71					15.2 db	30.7 daf	54.1						28.24 daf		0.49 daf											
						15.6	37.4	62.6						34.40		0.55											
ccc	LN599	CSIRO LR90		1.44	3.5	17.3 db	31.7 daf	47.5	64.2	4.3	8.5	1.5	0.7	25.91 daf	1	0.76 daf	0.14 daf	0.62				0.05	3.4	4.06			
'us'	1.73					17.4	40.0	60.0	81.0	5.4	10.8	1.9	0.9	32.82		0.96	0.18	0.78									

PERMIAN COALS OF EASTERN AUSTARLIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Foybrook
Liddell Collieries and DDH S1 , S3 and S4

PERMIAN COALS OF EASTERN AUSTARLIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Foybrook
Liddell Collieries and DDH S1 , S3 and S4

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth / Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vl+Cd+Dc	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Wittingham Coal — Baysewater seam	16.02				ccc	LN22063	CSIRO LR356		16	34 daf	42	6											
	37		2.03	CSIRO LR356	vs	1.85			19	36	45												
	18.85																						
	26		4.55		ccc	LN22067			15	26 daf	51	8											
						7.76			14	31	55												
					ccc	LN22065			12	26 daf	54	9											
					'lb'	5.92			13	27	60												
	11.99																						
Pikes Gully seam	79		4.33	CSIRO LR353	ccc	LN21885	CSIRO LR353		66	17 daf	11	6											
						2.97			70	18	12												
	16.32																						
	97.54																						
Liddell seam	88		5.29	CSIRO LR347 CSIRO LR277	ccc	LN10655	CSIRO LR277		80	10 daf	7	3											
						3.17			82	11	7												
	100.83																						
	16.59																						
Barrett seam	92		2.75	CSIRO LR347	ccc	LN21526	CSIRO LR347		64	19 daf	7	10											
						2.46			71	21	8												
	19.34																						

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc	LN22063	CSIRO LR356			3.1	16.2	27.4	53.3	66.9	4.1	7.7 daf	1.6	0.4	27.03 daf	12	0.18	0.34	0.44	0.006		0.05	1	0.06	69.5	22.2	25	6
'vs'	1.85					16.7	33.9	66.1	82.8	5.0	9.7	2.0	0.5	33.52		0.47	0.42	0.045						3.1	: 1		
ccc	LN22067	CSIRO LR356	~40		3.1	19.8 db 19.6	26.8 daf 53.1	52.3 daf 66.9	64.2	3.7	8.4 daf 10.9	1.5	0.3	26.69 daf 32.85	12	0.58	0.27 daf 0.55	0.31 0.39	0.052		0.04	1	0.57	57.4	31.9	15	10
'ccb'	7.76								92.1	4.7						0.74							1.8	: 1		
ccc	LN22065	CSIRO LR356			3.1	19.6 db 20.2	25.1 daf 52.4	52.2 daf 67.6	63.6	3.7	8.3 daf 10.9	1.4	0.3	25.36 daf 32.78	12	0.60	0.23 daf 0.30	0.27 0.35	0.063		0.06	1	0.76	52.3	32.3	15	9
'lb'	5.92								92.2	4.7						0.45							1.6	: 1		
						very high phosphorus in dirt bands and adjacent dull coal subsections - each analysed.																						
	11.99																										
Pikes Gully seam	79		4.33	CSIRO LR353	ccc	LN21885	CSIRO LR353	~40	3.3	11.8 db 12.2	35.3 daf 39.2	51.6 daf 60.8	64.9	4.7	8.2 daf 9.7	1.6	0.5	28.52 daf 34.03	3	0.86	0.37 daf 0.43	0.49 0.57	0.085		0.04	19	0.42	56.6	25.1	20	8
	16.32					2.97			82.3	5.6						1.00							2.2	: 1		
	97.54																										
Liddell seam	88		5.29	CSIRO LR277	ccc	LN10655	CSIRO LR277	132	2.3	8.4 db 8.6	38.5 daf 43.2	50.8 daf 56.8	73.9	5.3	7.8 daf 9.5	1.9	0.4	30.87 daf 34.59	4½	0.43	0.07 daf 0.08	0.34 0.40	0.095		0.00	6	1.38	43.6	24.7		
						3.17			82.8	5.9						0.48							1.8	: 1		
	100.83				1.30F	LN10654	CSIRO LR277		2.4	3.6 db 3.6	41.2 daf 43.6	52.9 daf 56.2	78.5	5.7	7.4 daf 7.8	2.0	0.4	33.10 daf 35.20	4½	0.45	0.04 daf 0.04	0.41 0.44	0.093		0.08		0.18				
	16.59								83.4	6.1						0.48											
Barrett seam	92		2.75	CSIRO LR347	ccc	LN21526	CSIRO LR347	~43	2.9	14.0 db 14.4	35.7 daf 43.0	47.4 daf 57.0	67.7	4.8	8.4 daf 10.0	1.7	0.5	28.20 daf 33.94	3½	0.42	0.12 daf 0.15	0.30 0.40	0.017		0.04	1	1.08	51.0	26.1	40	4
	19.34					2.46			81.5	5.8						0.75							2.0	: 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Howick
Liddell SCM and DDH S5 , S6 and S7

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Howick
Liddell SCM and DDH S5 , S6 and S7

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth / Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vl+Cd+Dc	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Coal Measures — Farrells Creek seam	17.58																						
	30		4.24	CSIRO LR354	ccc	LN21929	CSIRO LR354		14	30 daf	52	4											
						4.0			14	32	54												
	21.82																						
	12.51																						
Coal Measures — Arties seam	79		4.72	CSIRO LR355	ccc	LN21935	CSIRO LR355		63	21 daf	9	7											
						2.66			66	22	10												
	16.23																						
Wittingham Coal Measures — Liddell seam	74		2.95	CSIRO LR221	ccc	LN7401	CSIRO LR221		68	19 daf	12	1											
						2.77			69	19	12												
	76.20																						
	74.18																						
	20.68																						
Barrett seam	80		3.00	CSIRO LR357	ccc	LN22277	CSIRO LR357		61	25 daf	7	7											
						2.71			66	27	7												
	25.48																						

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc	LN21929	CSIRO LR354	~95		3.2	13.2 db 15.6	28.0 daf 33.5	55.6 daf 66.5	69.3	4.1	8.3 daf 10.0	1.4	0.3	28.01 daf 33.48	1	0.48	0.06 daf 0.07	0.34 0.41	0.030		0.08	41	0.46	55.2	35.4	10	7
ccc	LN21935	CSIRO LR355	89		3.1	11.6 db 14.1	35.4 daf 41.8	49.9 daf 58.5	70.2	4.9	8.1 daf 9.5	1.6	0.5	29.17 daf 34.20	5	0.48	0.14 daf 0.17	0.34 0.40	0.027		0.04	9	0.32	64.0	27.0	30	7
	2.66								82.3	5.7						0.82							2.4	: 1		
ccc	LN7401	CSIRO LR221	132		2.8	8.0 db 8.6	36.8 daf 43.4	52.4 daf 56.6	74.0	5.1	7.8 daf 9.2	1.8	0.5	30.71 daf 34.41	5½	0.48	0.06 daf 0.54	0.42 0.47	0.058		0.08	4	0.15	54.9	31.6		
	2.77								82.9	5.7													1.7	: 1		
1.30F	LN7400				3.1	2.6 db 2.7	37.1 daf 39.7	54.9 daf 60.3	78.4	5.4	8.1 daf 8.9	1.8	0.5	32.73 daf 34.68	4½	0.53	0.01 daf 0.56	0.02 0.03	0.056		0.05		0.06				
									83.1	5.8																	
ccc	LN22277	CSIRO LR357	89		3.0	12.9 db 13.9	34.5 daf 41.0	49.6 daf 59.0	69.2	4.9	7.7 daf 9.2	1.8	0.5	29.02 daf 34.36	2½	0.54	0.03 daf 0.64	0.51 0.60	0.029		0.04	2	0.10	59.1	30.4	90	10
	2.71								82.2	5.8						0.64							2.0				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Denman PA Mangoola DDH 2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: Denman PA Mangoola DDH 2

PETROGRAPHIC ANALYSES — CHEMICAL ANALYSES

STRATIGRAPHY	Depth / Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vl+Cd+Dc	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Wittingham CM — Bayswater seam	28.73																						
	34		3.42	CSIRO LR383	ccc	LN25585	CSIRO LR383	85	19	27 daf	46	15											
						3.44			22	24	53												
	32.55																						

Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	M	A	VM	FC	C	H	O	N	S	SE MJ/kg	CSN	TS	P+S	O	P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
ccc	LN25585	CSIRO LR383	85	1.54	5.9	20.2 db 21.5	34.5 daf 33.2	39.4 daf 64.8	59.4	3.3	9.5 daf 18.1	1.2	0.3	23.31 daf 31.82	0	0.36	0.04 daf 0.95	0.32 0.43	0.004		0.04	6	1.32				
	3.44								80.5	4.4		1.6	0.4			0.49											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: DDH S2 and Camberwell DDH R8

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
WITTINGHAM COAL MEASURES
LOCATION: DDH S2 and Camberwell DDH R8

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth — Vit % mmf	Section	Thickness	Source
Singleton Coal Measures	14·21			
Ravensworth seam	58		6·25	CSIRO LR350
	20·46			
	26·21			
Bayswater seam	31·23		5·02	CSIRO LR135
	35·64			
	37·65			
	42·88		1·094	
	43·97			
	48·24		46	
	48·42			
	67·16		2·29	
	69·46			
	96·24			
	98·99			
	120·38		0·86	
	121·24			
	141·32		0·66	
	147·96			
	174·21		1·99	
	176·20			
	181·66		1·01	
	182·67			
	199·40		1·75	
	201·15			
	234·22		1·55	
	251·77			
	250·91		91	
	251·82			
	252·55		66	
	255·24			
	272·72		1·34	
	274·06			
	288·86		041	
	289·77			

MICROLITHOTYPE - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	V+C	Vt+CD+DC	I	SC+MM
'cc'	LN21744 / 4·38	CSIRO LR350		40 / 43	30 / 32	25 / 25	7
ccc'	LN21851 / 4·74			16 / 17	27 / 29	51 / 54	6

MACERAL - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad: M	A	VM	FC	ULTIMATE wt % ad: C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad: S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH: SiO_2 %	Al_2O_3 %	TRACE: B ppm ad	Ge ppm ad
ccc'	LN21744 / 4·38	CSIRO LR350	~45		3·5	13·4 / 13·9	31·2 / 31·6	51·9 / 52·4	68·6 / 82·4	4·4 / 5·3	8·2 / 9·7	1·5 / 1·9	0·4 / 0·5	27·96 / 33·66	1	0·50 / 0·60	0·07 / 0·08	0·43 / 0·52	0·047		0·06	1	0·32	60·1 / 2·0	29·4 / 1	20	10
ccc'	LN21961 / 4·74		~91		2·8	17·2 / 17·7	27·1 / 35·8	52·9 / 46·2	66·1 / 82·6	4·0 / 5·0	8·2 / 10·2	1·5 / 1·9	0·2 / 0·3	26·75 / 33·45	1	0·37 / 0·46	0·12 / 0·15	0·26 / 0·31	0·022		0·09	1	0·14	53·3 / 1·5	35·3 / 1	7	9
ccc'	LN2314 / 0·87	CSIRO LR350	91	1·11	3·5	17·4 / 18·0	31·4 / 39·7	47·7 / 40·3	65·1 / 82·2	4·5 / 5·7	7·4 / 9·7	1·4 / 1·8	0·5 / 0·6	26·85 / 33·92	2	0·49 / 0·62											
'b'	LN2318 / 0·60		81	1·44	3·2	19·6 / 20·2	31·4 / 40·6	45·8 / 59·4						25·66 / 33·22	2	0·49 / 0·63											
ccc'	LN2234 / 2·04		44	1·41	3·3	13·7 / 14·2	32·9 / 34·7	50·1 / 60·3	68·4 / 82·4	4·7 / 5·7	7·9 / 9·5	1·4 / 1·7	0·6 / 0·7	28·24 / 34·03	3+	0·60 / 0·72											
'c' 'ls'	LN2321 / 0·87	CSIRO LR135	51	1·37	2·7	13·0 / 13·4	33·3 / 39·5	51·0 / 60·5						29·24 / 34·71	2+	0·45 / 0·53											
E 'k'	LN2242 / 0·64		71	1·34	3·1	11·2 / 11·6	34·2 / 34·9	51·5 / 60·1						29·47 / 34·91	+	0·50 / 0·59											
ccc'	LN2506 / 1·60		~90	1·34	2·7	11·6 / 12·1	34·8 / 40·7	50·7 / 59·3	70·7 / 82·7	5·1 / 6·0	7·5 / 8·7	1·6 / 1·9	0·6 / 0·7	29·66 / 34·68	3+	0·64 / 0·75											
ccc'	LN2247 / 1·00		90	1·37	3·1	13·6 / 14·0	30·7 / 34·9	52·6 / 65·1	69·1 / 83·0	4·7 / 5·6	7·5 / 9·0	1·6 / 1·9	0·4 / 0·5	28·51 / 34·01	3+	0·42 / 0·50											
ccc'	LN2249 / 1·01	CSIRO LR135	44	1·41	2·7	17·5 / 18·0	34·0 / 42·6	45·9 / 57·3	63·7 / 82·5	4·8 / 6·0	7·3 / 9·2	1·5 / 1·9	0·5 / 0·6	27·35 / 34·24	3+	0·51 / 0·64											
ccc'	LN2258 / 1·21		93	1·35	2·5	11·0 / 11·3	34·3 / 42·0	50·2 / 58·0	72·0 / 83·3	5·3 / 6·1	7·0 / 8·0	1·7 / 2·0	0·5 / 0·6	30·34 / 35·08	6	0·59 / 0·82											
B 'us'	LN2260 / 0·91		83	1·41	2·6	17·6 / 18·1	33·3 / 41·1	46·5 / 58·3						27·39 / 34·31	4	0·94 / 1·18											
G 'ls'	LN2264 / 0·66		92	1·35	2·6	12·0 / 12·3	33·7 / 39·5	41·7 / 40·5						29·57 / 34·61	4+	0·53 / 0·62											
ccc'	LN2269 / 1·06		82	1·39	2·6	15·6 / 16·0	33·3 / 40·7	48·5 / 59·3	68·1 / 83·1	4·8 / 5·9	6·8 / 8·4	1·6 / 2·0	0·5 / 0·6	28·26 / 34·52	6	0·61 / 0·62											
B	LN2271 / 0·91		54	1·41	2·4	17·4 / 17·8	33·7 / 42·0	46·5 / 58·0						27·87 / 34·13	4+	0·66 / 0·82											

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE AND TOMAGO COAL MEASURES
LOCATION: Shell Dural South No 1

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
NEWCASTLE AND TOMAGO COAL MEASURES
LOCATION: Shell Dural South No 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Newcastle Coal Measures	862			Shell Dural South No1
	62			
	865			
	879			
	39			
	880			
	915			
	69			
	71			
	917			
	934			
	69			
	935			
	947			
	66			
	948			
	975			
	67			
	977			
	978			
	81			
	980			
	982			
	80			
Coal Measures	984			
	1169			
	53			
	1170			
	1195			
	60			
	1196			
	1202			
	56			
Kulnura Marine Tongue	1204			
	1245			
	88			
Tomago	1546			
	1578			
	69			
	1579			
	1597			
	82			
	1600			
	1604			
	78			
	1605			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM
160F	PN11690	CSIRO	41	42	37 54	15 mm 8 62	19 27 31
160F	PN11691			65	21 23	31 mm 33	41 44
160F	PN11692		4	41	8 65	14 mm 15	37 22
160F	PN11693		15	53	10 69	14 mm 13	23 18
160F	PN11694		46	51	27 59	9 mm 31	13 10
160F	PN11695		37	49	22 56	16 mm 25	13 19
160F	PN11696		58	63	26 60	9 mm 30	12 10
160F	PN11697		80	71	7 85	6 mm 8	16 7
160F	PN11698		6	64	9 76	11 mm 11	16 13
160F	PN11699		56	47	31 49	18 mm 32	4 19
160F	PN11700		62	36	43 37	17 mm 45	5 18
160F	PN11701		37	27	58 29	9 mm 62	6 9
160F	PN11702		32	66	2 83	12 mm 3	20 14
160F	PN11703			61	1 95	2 mm 2	36 3
160F	PN11704		30	83	3 94	2 mm 3	12 3
160F	PN11705		18	78	1 92	6 mm 1	15 7

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
160F	PN11690	CSIRO	42	58 62	35 mm 38	7 27
160F	PN11691			39 34	60 mm 61	1
160F	PN11692		4	59 69	27 mm 31	14
160F	PN11693		15	65 71	26 mm 29	9
160F	PN11694		46	65 69	29 mm 31	6
160F	PN11695		37	63 66	32 mm 34	5
160F	PN11696		58	64 67	32 mm 33	4
160F	PN11697		80	78 84	15 mm 16	7
160F	PN11698		6	76 80	19 mm 20	5
160F	PN11699		56	52 53	47 mm 47	1
160F	PN11700		62	59 60	40 mm 40	1
160F	PN11701		37	56 56	44 mm 44	
160F	PN11702		32	83 88	11 mm 12	6
160F	PN11703		5	66 69	30 mm 31	4
160F	PN11704		30	80 82	18 mm 18	2
160F	PN11705		18	75 79	21 mm 22	4

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
160F	LN22147	CSIRO	42		1.2	23.5	17.8	55.5	65.4	3.6	7.7	1.2	0.4	26.49	5½
						db 28.8	daf 24.3	daf 75.7	89.2	4.9	daf 5.6	1.7	0.6	daf 36.17	
160F	LN22148		65		1.5	16.4	16.6	65.5	74.0	3.7	2.7	1.3	0.4	29.66	2½
						db 18.7	daf 20.2	daf 79.8	90.2	4.5	daf 3.2	1.6	0.5	daf 36.15	
160F	LN22149		4		1.3	21.4	16.3	53.0	60.8	3.3	3.5	1.2	0.5		
						db 29.8	daf 23.5	daf 76.5	87.9	4.7	daf 5.1	1.8	0.7		
OF	LN22150		15		1.7	23.5	16.4	60.4	66.6	3.4	4.2	1.4	0.4	26.26	1
						db 23.9	daf 21.8	daf 78.2	87.7	4.5	daf 5.5	1.9	0.6	daf 35.10	
160F	LN22151		46		2.0	21.0	16.4	61.6	68.3	3.6	3.2	1.5	0.4	27.63	2
						db 21.4	daf 19.9	daf 80.1	88.7	4.7	daf 4.1	1.9	0.6	daf 35.89	
160F	LN22152		37		1.6	19.8	15.8	62.8	70.4	3.6	2.8	1.4	0.4	28.42	6½
						db 20.1	daf 16.1	daf 79.9	89.6	4.5	daf 3.5	1.8	0.6	daf 36.17	
160F	LN22153		58		1.9	19.0	15.4	63.7	70.4	3.6	3.1	1.6	0.4	28.68	3
						db 19.4	daf 15.8	daf 80.5	89.0	4.6	daf 3.8	2.0	0.6	daf 35.98	
160F	LN22154		80		1.4	23.7	15.2	59.7	66.5	3.6	2.8	1.6	0.4	26.94	6
						db 24.0	daf 20.3	daf 79.7	88.7	4.9	daf 3.7	2.1	0.6	daf 35.94	
160F	LN22155		6		1.3	23.0	15.6	60.1	67.5	3.6	2.5	1.6	0.5	27.40	
						db 23.3	daf 20.6	daf 79.4	89.2	4.8	daf 3.2	2.1	0.7	daf 36.19	
160F	LN22156		56		1.3	14.9	13.4	70.4	75.4	3.6	2.8	1.6	0.4	30.08	1
						db 15.1	daf 13.6	daf 86.4	96.0	4.3	daf 3.5	1.9	0.5	daf 38.31	
160F	LN22157		42		1.2	13.3	14.1	71.4	77.6	3.8	2.6	1.7	0.4	30.89	3
						db 13.5	daf 16.5	daf 83.5	90.0	4.4	daf 3.1	2.0	0.5	daf 36.12	
160F	LN22158		37		1.5	20.5	15.2	64.8	69.5	3.4	3.2	1.5	0.4	27.68	½
						db 20.8	daf 16.9	daf 83.1	89.0	4.4	daf 4.1	2.0	0.5	daf 35.45	
160F	LN22159		32		2.1	25.2	8.4	64.3	65.5	3.0	2.1	1.7	0.4	25.73	0
						db 25.7	daf 11.5	daf 88.5	90.1	4.1	daf 2.9	2.3	0.6	daf 35.36	
160F	LN22160		5		1.8	25.8	9.0	63.4	65.6	2.9	2.0	1.6	0.4	25.79	
						db 26.3	daf 12.4	daf 87.6	90.5	4.0	daf 2.7	2.2	0.6	daf 35.66	
160F	LN22161		30		1.8	21.3	9.3	67.6	69.6	3.1	2.2	1.6	0.4	27.49	½
						db 21.7	daf 12.1	daf 87.9	90.5	4.1	daf 2.8	2.1	0.5	daf 35.75	
160F	LN22162		18		2.1	21.1	9.7	67.1	69.4	3.1	2.4	1.5	0.4	27.45	½
						db 21.6	daf 12.6	daf 87.4	90.4	4.0	daf 3.1	2.0	0.5	daf 35.70	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
160F	LN22147	CSIRO	42		0.46	0.02 daf	0.44	0.004				0.16				
					0.63	0.03	0.60									
160F	LN22148		65		0.46	0.04 daf	0.42	0.008				0.43				
					0.56	0.05	0.51									
160F	LN22149		4		0.48			0.020								
					0.61											
OF	LN22150		15		0.46	0.03 daf	0.43	0.005				0.40				
					0.61	0.09	0.51									
160F	LN22151		46		0.62	0.07 daf	0.45	0.003				0.49				
					0.68	0.09	0.59									
160F	LN22152		37		0.48	0.04 daf	0.44	0.021				0.44				
					0.61	0.05	0.56									
160F	LN22153		58		0.50	0.06 daf	0.44	0.190				0.27				
					0.63	0.08	0.55									
160F	LN22154		80		0.48	0.03 daf	0.45	0.250				0.24				
					0.64	0.04	0.60									
160F	LN22155	CSIRO	6		0.50			0.23								
					0.66											
160F	LN22156		56		0.47	0.05 daf	0.42	0.001				0.31				
					0.64	0.05	0.58									
160F	LN22157		42		0.50	0.05 daf	0.45	0.002				0.18				
					0.58	0.06	0.52									
160F	LN22158		37		0.56	0.17 daf	0.39	0.004				0.48				
					0.72	0.22	0.50									
160F	LN22159		32		0.56	0.13 daf	0.43	0.20				0.16				
					0.91	0.14	0.77									
160F	LN22160		5		0.45	daf		0.013				0.30				
					0.62											
160F	LN22161		30		0.56	0.17 daf	0.39	0.011				0.30				
					0.73	0.22	0.51									
160F	LN22162		18		0.56	0.14 daf	0.42	0.023				0.31				
					0.73	0.18	0.55									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Appin
Illuka DDH 21

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra CM	498.59			CSIROLR385
Bulli seam	35		2.98	
	501.57			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
CCC	LN33888 2.91	CSIROLR385	90.3	32 35	60 mm 65	8

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
CCC	LN33888 2.91	CSIROLR385	90.3	1.34	1.1	9.9	18.9	70.1	79.4	4.2	3.4	1.6	0.5	31.82	2½
						db 10.0	daf 21.3	daf 78.7	89.2	4.7	daf 4.7	1.7	0.3	daf 35.77	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN33888 2.91	CSIROLR385	90.3	1.34	0.31	0.04 daf	0.27	0.061		0.01	2	0.24	50.2	34.0	2	4
					0.35	0.04	0.31						13	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Unanderra
A.I.S. Wongawilli No 11 Bore

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Wongawilli seam	313.88			CSIROLR264
	76		3.57	
	317.45			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM
CCC	LN9916 2.68	CSIROLR264		62 67	16 mm 17	14 15	8

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
CCC	LN9916 2.68	CSIROLR264			0.9	18.0	23.6	57.3	71.0	4.3	3.9	1.4	0.5	29.02	
						db 18.2	daf 24.3	daf 75.7	87.6	5.3	daf 4.7	1.8	0.6	daf 35.83	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN9916 2.68	CSIROLR264			0.53	0.07 daf	0.46	0.006		0.01		0.52	65.0	28.0	20	4
					0.65	0.09							2.3	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Stanwell Tops
Metropolitan Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Bulli seam	340.00			CSIROLR204
	18		2.41	
	342.41			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD-DC	I	SC+MM
CCC	LN6722 2.41	CSIROLR204	100	14 14	27 27	58 59	1

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
CCC	LN6722 2.41	CSIROLR204	100	1.42	0.9	12.7 db 12.8	19.3 daf 22.3	67.1 daf 77.7	77.0	4.1	3.6 daf 4.1	1.4	0.3	30.80 daf 35.63	1
								vitrain	89.1	4.8		1.6	0.4		
160F	LN6721				0.9	2.7	25.6	70.8	86.4	5.1	2.9	1.8	0.4	35.47	>9
						2.7	26.5	73.5	89.5	5.3	daf 3.0	1.8	0.4	daf 36.77	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN6722 2.41	CSIROLR204	100	1.42	0.33	0.02 daf	0.31	0.071		0.02	<1	0.62	45.5	37.9	4	5
					0.38	0.03	0.36						1.2	1		
160F	LN6721				0.43	0.04 daf	0.39	0.005		0.01		0.04				
					0.45	0.04	0.41									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Oakdale
Valley No 2 Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	MACROSCOPIC
Illawarra C.M. Bulli seam	~200·00 / 97 / 261·40		1·40	CSIRO LR308	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc	LN14639 1·19	CSIRO LR308	100	36 37	20 mmf 20	39 40	2

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
130F	LN14851	CSIRO LR308		93	7	

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN14639 1·19	CSIRO LR308	100	1·58
130F	LN14851			
	LN7539			

PROXIMATE wt % ad

M	A	VM	FC
1·6	9·0 db 9·1	27·2 daf 30·4	62·2 daf 69·6
1·6	2·6 db 2·6	35·1 daf 36·6	60·7 daf 63·4

vitrain analyses

ULTIMATE wt % ad

C	H	O	N	S
77·0	4·5	6·0 daf 6·7	1·5 daf 1·7	0·4 daf 0·5
85·4	6·5	6·6 daf 6·9	1·9 daf 2·0	0·8 daf 0·8

SE MJ/kg	CSN
31·16 daf 34·84	4½
33·43 daf 35·43	9

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·44	0·004 daf 0·04	0·40 daf 0·45	0·016		0·01	4	0·06
0·51	0·00 daf 0·51		0·014		0·04		0·04

ASH

SiO_2 %	Al_2O_3 %
57·6	34·8
1·6	1

TRACE

B ppm ad	Ga ppm ad
25	25

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Oakdale
Valley No 1 Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	MACROSCOPIC
Illawarra C.M. Bulli seam	~230·00 / 58 / 281·34		1·34	CSIRO LK309	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc	LN14650 1·34	CSIRO LR309	100	43 45	24 mmf 25	28 30	5

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
130F	LN14649	CSIRO LR309		92	8	

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN14650 1·34	CSIRO LR309	100	1·38
ws	1·34			
130F	LN14649			

PROXIMATE wt % ad

M	A	VM	FC
1·6	10·7 db 10·7	28·5 daf 32·5	57·2 daf 67·5
2·0	3·2 db 3·3	34·3 daf 34·2	60·5 daf 63·8

vitrain analysis

ULTIMATE wt % ad

C	H	O	N	S
75·4	4·6	5·8 daf 6·6	1·5 daf 1·8	0·4 daf 0·5
85·5	5·5	6·1 daf 6·4	1·8 daf 1·9	0·6 daf 0·6

SE MJ/kg	CSN
30·59 daf 34·87	6
35·52 daf 38·52	

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·42	0·03 daf 0·03	0·39 daf 0·45	0·042		0·01	3	0·04
0·66	0·00 daf 0·00	0·66 daf 0·88	0·016		0·02		0·04

ASH

SiO_2 %	Al_2O_3 %
55·2	37·8
1·5	1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Oakdale
Wollondilly extended Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	MACROSCOPIC
Illawarra C.M. Bulli seam	~335·26 / 43 / 378·40		3·12	CSIRO LR235	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc	LN8213 3·06	CSIRO LR235		25 23	38 mmf 36	35 36	2

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN8213 3·06	CSIRO LR235		1·31

PROXIMATE wt % ad

M	A	VM	FC
1·5	9·6 db 9·6	26·1 daf 29·3	63·0 daf 70·7

ULTIMATE wt % ad

C	H	O	N	S
77·3	4·4	6·5 daf 6·3	1·6 daf 1·7	0·3 daf 0·4
84·6	5·0			

SE MJ/kg	CSN
31·19 daf 34·48	3

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·35	0·02 daf 0·02	0·33 daf 0·37	0·007		0·00	4	0·04
0·39							

ASH

SiO_2 %	Al_2O_3 %
51·4	39·7
1·3	1

TRACE

B ppm ad	Ga ppm ad
9	3

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Oakdale
Oakdale S.C.M.

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	MACROSCOPIC
Illawarra C.M. Bulli seam	~388·62 / 42 / 389·60		1·98	CSIRO LR240	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc	LN8554 1·98	CSIRO LR240		24 24	35 mmf 35	40 41	1

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	LN 8554 1·98	CSIRO LR240		1·31
ws				

PROXIMATE wt % ad

M	A	VM	FC
1·6	10·5 db 10·7	26·0 daf 29·6	61·9 daf 70·4

ULTIMATE wt % ad

C	H	O	N	S
76·0	4·4	5·7 daf 6·3	1·5 daf 1·7	0·3 daf 0·4
84·6	5·0			

SE MJ/kg	CSN
30·98 daf 35·26	3

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·36	0·09 daf 0·10	0·27 daf 0·31	0·063		0·02	1	0·12
0·41							

ASH

SiO_2 %	Al_2O_3 %
61·2	30·4
20·1	1

TRACE

B ppm ad	Ga ppm ad
20	2

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Oakdale
Nattai Bulli Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	MACROSCOPIC
Bulli seam	54		1·67	CSIRO LR223	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM
ccc	1·67	CSIRO LR223		37 38	31 mmf 32	30 30	2

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD

PROXIMATE wt % ad

M	A	VM	FC

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg	CSN

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Mulgoa No 2 Bore

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	MACROSCOPIC
Illawarra C.M.	784·08 / 52 / 789·15		3·05	CSIRO F442	

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+Cl+DC	I	SC+MM

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
ws	LN11446 ON 21364 3·05			40 mmf 62	37 47	23

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ws	LN11446 3·05	CSIRO F442		1·41
	LN 11545 3·05			1·3

PROXIMATE wt % ad

M	A	VM	FC
1·4	11·0 db 12·2	24·7 daf 27·1	59·1 daf 65·5
	11·2 db 12·5	24·2 daf 27·1	70·8 daf 79·5
	11·2 db 12·5	24·7 daf 27·6	71·5 daf 79·9

ULTIMATE wt % ad

C	H	O	N	S
74·2	4·2	4·4 daf 4·8	1·5 daf 1·6	0·3 daf 0·3
87·6	5·0	6·3 daf 6·8	1·8 daf 2·0	0·3 daf 0·3
83·6	5·3	4·8 daf 5·2	2·0 daf 2·1	0·5 daf 0·5
87·0	5·5	4·4 daf 4·8	2·1 daf 2·3	0·5 daf 0·5

SE MJ/kg	CSN
29·75 daf 32·15	2½
35·15 daf 38·27	9

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0·34	0·03 daf 0·03	0·31 daf 0·34	0·003		0·04	4	1·07
0·51	0·00 daf 0·00	0·51 daf 0·45	0·002				
0·51							

ASH

SiO_2 %	Al_2O_3 %
53·0	26·8
20·1	1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Bulli
Excelsior No 2 Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. Bulli seam	335·28 / 46 / 337·01		1·73	CSIROLR216	ccc ws	LN7259 1·73	CSIROLR216	100	31 32	28 28	39 40	2											

CHEMICAL ANALYSES																																	
Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad				ULTIMATE wt % ad					SE MJ/kg	CSN	MINOR wt % ad								ASH		TRACE	
					M	A	VM	FC	C	H	O	N	S			S			P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
																TS	P+S	O									
ccc	LN7259	CSIROLR216	100	1·38	1·2	11·2	22·2	65·4	77·4	4·3	3·6	1·5	0·3	31·33	54	0·35	0·07	0·31	0·025		0·00	2	1·80	46·2	26·7	3	3
ws	1·73					11·3 db	25·4 daf	14·5 63·3 daf	84·8	4·9	4·2 daf	1·7	0·4	34·85		0·42	0·08	0·34						1·7	1		
									analysis of vitrain																		
1·30F	LN7257				1·0	3·8 db	28·4 daf	67·8	85·6	5·1	3·4 daf	1·6	0·4	35·17	>9	0·45	0·09	0·44	0·021		0·00		0·09				
						28	29·3	70·4	84·0	5·3	3·5	1·7	0·5	36·54		0·47	0·09	0·46									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Bulli
A.I.S. Bulli No 13 Bore

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. Bulli seam	385·63 / 54 / 387·72		2·04	CSIROLR241	ccc ws	LN9536 2·08	CSIROLR241		38	31	31	tr											

CHEMICAL ANALYSES																																	
Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad				ULTIMATE wt % ad					SE MJ/kg	CSN	MINOR wt % ad								ASH		TRACE	
					M	A	VM	FC	C	H	O	N	S			S			P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
																TS	P+S	O									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Bulli
South Bulli Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. Bulli seam	320·04 / 39 / 322·40		2·86	CSIROLR217	ccc	LN7258 2·82	CSIROLR217	100	24 24	29 29	46 47	1											

CHEMICAL ANALYSES																																	
Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad				ULTIMATE wt % ad					SE MJ/kg	CSN	MINOR wt % ad								ASH		TRACE	
					M	A	VM	FC	C	H	O	N	S			S			P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
																TS	P+S	O									
ccc	LN7258	CSIROLR217														0·41	0·18	0·23	0·066							6	3
																	vitrain										
1·30F	LN7257															0·38	0·02	0·36	0·013								

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Appin
A.I.S. Appin No 9 Bore

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. Bulli seam	478·79 / 45 / 481·68		2·69	CSIROLR333	ccc ws	LN18749 2·90	CSIROLR333		28 29	30 31	39 40	3											

CHEMICAL ANALYSES																																	
Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad				ULTIMATE wt % ad					SE MJ/kg	CSN	MINOR wt % ad								ASH		TRACE	
					M	A	VM	FC	C	H	O	N	S			S			P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
																TS	P+S	O									
ccc	LN18749	CSIROLR333		1·34	1·0	9·7 db	21·3 daf	68·0	79·2	4·2	4·1 daf	1·5	0·3	32·05 daf	7	0·34	0·01	0·33	0·077		0·00	1	0·70	41·0	33·6	3	4
ws	2·90					9·8	23·9	76·1	88·7	4·8	4·6	1·6	0·4	35·97		0·39	0·01	0·37						14	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Austinmeer
Austinmeer Central and Excelsior No 2 Collieries

PETROGRAPHIC ANALYSES

MACROSCOPIC					MICROLITHOTYPE - VOL %							MACERAL - VOL %							REFLECTANCE			
STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+C	Vt+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra Coal Measures — Bulli seam	~200·00 / 201·18		1·18	CSIROLR268 and 58																		
Balgownie seam	~320·00 / 320·86		0·86		ccc ws	LN10121 0·86	CSIROLR268	100	23 24	22 22	52 54	3											
Cape Horn seam			3·14										1·30F	LN10120	CSIROLR268		9·4	6				
Hargrave seam			0·41																			
Wongawilli seam			10·36																			

Section measured at Scarborough Rly by Hanlon, D.M. Tech Rept. Vol 1952

CHEMICAL ANALYSES																																	
Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	PROXIMATE wt % ad				ULTIMATE wt % ad					SE MJ/kg	CSN	MINOR wt % ad								ASH		TRACE	
					M	A	VM	FC	C	H	O	N	S			S			P	F	Cl	As ppm	CO_2	SiO_2 %	Al_2O_3 %	B ppm ad	Ga ppm ad
																TS	P+S	O									
ccc	LN7212 1·17	CSIROLR268 and LR58	100	1·39	1·2	10·1 db 10·2	23·4 daf 26·4	65·3 73·6	78·8 88·8	4·4 5·0	3·8 daf 4·5	1·4 1·6	0·8 0·8	31·80 daf 35·84	5	0·34 0·38	0·03 0·03	0·31 0·35	0·005		0·01		1·06	41·6 16	25·5 1	1·5	2·5
ccc	LN10121	CSIROLR268	100	1·43	0·9	14·8 db	20·3 daf	64·0	74·9	4·0	3·6 daf	1·5	0·3	30·10 daf	1·2	0·37	0·01	0·36	0·005		0·00	2	1·41	55·6	22·7	6	3
ws	0·86					14·8	24·1	75·9	88·9	4·8	4·5	1·5	0·3	35·73		0·44	0·01	0·43						2·4	1		
									vitrain analysis																		
1·30F	LN10120				0·8	2·2 db	21·0 daf	70·0	86·1	5·1	3·1 daf	1·1	0·5	35·68 daf	1·9	0·52	0·00	0·52	0·001		0·00		0·06				
						2·2	21·8	72·2	89·2	5·2	3·3	1·8	0·5	36·77		0·54	0·00	0·54									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Wilton
Wollongong E Bore

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures	440.21			
Bulli seam	29		2.38	CSIRO LR344
	442.59			
	451.00			
Balgownie seam	36		0.84	
	451.89			
	476.83			
Wongawilli seam	76		2.22	
	474.05			
	528.00			
Tongarra seam	69		1.59	
	329.59			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
CCC	LN20389 2.38	CSIRO LR344		15 16	25 mmf 24	56 58	4
CCC	LN20406 0.84	CSIRO LR344		19 21	27 mmf 30	43 49	11
CCC	LN20415 2.01	CSIRO LR344		50 60	18 mmf 21	16 19	16
CCC	LN20506 1.30	CSIRO LR344		42 58	16 mmf 22	14 20	28

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
CCC	LN20389 2.38	CSIRO LR344		1.31	1.2	12.6 db 12.8	20.3 daf 23.6	65.9 daf 76.4	76.7 69.0	4.0 4.6	3.8 daf 4.5	1.4 1.6	0.3 0.3	30.89 daf 35.84	1
CCC	LN20406 0.84	CSIRO LR344		1.41	1.1	16.5 db 16.7	20.3 daf 24.1	62.1 daf 75.3	75.2 68.9	3.8 4.6	3.6 daf 4.7	1.3 1.6	0.2 0.2	29.42 daf 35.10	1
CCC	LN20415 2.01	CSIRO LR344		1.40	1.1	18.7 db 18.9	19.5 daf 24.3	60.7 daf 75.7	71.3 68.9	4.0 4.9	2.9 daf 3.8	1.5 1.8	0.5 0.6	28.91 daf 36.05	8½
CCC	LN20506 1.30	CSIRO LR344		0.8		25.6 db 25.8	19.2 daf 25.4	50.4 daf 74.6	65.8 67.0	3.5 4.6	4.8 daf 6.4	1.3 1.7	0.2 0.3	26.28 daf 34.75	5½

Sample type	Sample number – Thickness analysed	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN20389 2.38	0.30 0.35 db 0.30	0.04 0.05 daf 0.05	0.26 0.30	0.047		0.02	<1	0.64	50.0 56.4 14.4	35.4 39.3	4	5
CCC	LN20406 0.84	0.40 0.49	0.05 0.06 daf 0.06	0.35 0.42	0.005		0.02	<1	1.73	58.9 34.4	17.4 20.5	7	7
CCC	LN20415 2.01	0.50 0.62	0.01 0.01 daf 0.01	0.44 0.61	0.007		0.02	<1	0.60	63.8 25.5	25.5 31.1	20	7
CCC	LN20506 1.30	0.44 0.58	0.05 0.07 daf 0.52	0.39	0.006		0.02	<1	3.44	63.1 51.1	12.4 15.1	6	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Campbelltown
D.M. Bore 66 (Camden)

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth to Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures	572.85			
Bulli seam	24		2.54	CSIRO LR334
	575.34			
	585.23			
Balgownie seam	30		1.25	
	586.47			
	598.88			
	599.87			
	606.81			
Woronora seam				
	611.86			
	624.68			
Wongawilli seam				
	685.01			
	685.20			
American Creek seam				
	697.80			
Tongarra seam	682.75			
	693.54			
	715.86			
Woonona seam				
	714.90			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
CCC	LN18783 2.44	CSIRO LR334		11 12	22 mmf 24	59 64	8
CCC	LN18785 1.25	CSIRO LR334		15 16	25 mmf 27	53 57	7

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN
CCC	LN18783 2.44	CSIRO LR334		1.41	1.0	15.6 db 15.9	17.1 daf 20.4	66.3 daf 79.6	73.4 81.4	3.8 4.6	4.5 daf 5.6	1.4 1.5	0.3 0.3	29.70 daf 35.59	1
CCC	LN18785 1.25	CSIRO LR334		1.43	1.0	19.8 db 19.0	18.2 daf 22.6	62.0 daf 77.4	70.9 78.5	3.6 4.5	4.1 daf 5.0	1.3 1.6	0.3 0.4	28.26 daf 35.22	1

Sample type	Sample number – Thickness analysed	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN18783 2.44	0.24 0.36 db 0.36	0.03 0.04 daf 0.04	0.26 0.31	0.078		0.01	<1	0.40	57.9 19.1	30.4 40.1	5	6
CCC	LN18785 1.25	0.36 0.44	0.00 0.00 daf 0.00	0.35 0.44	0.011		0.02	<1	1.85	49.5 20.0	24.7 32.1	6	4

GSNSW

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Coalcliff
South Clifton Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Bulli seam	425.00 / 39 / 426.93		1.93	CSIROLR206	WS'	LN6756 1.92	CSIROLR206	100	22 / 22	32 / 33	44 / 45	2											

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
WS'	LN6756 1.92	CSIROLR206	100	1.44	1.0	11.8 db / 11.9 daf	21.0 / 24.1	66.2 / 75.9 vitrain	77.6 / 89.1	4.3 / 4.9	3.7 / 4.1 analysis	1.4 / 1.6	0.2 / 0.3	31.31 daf / 35.89	5	0.36 / 0.41	0.01 daf / 0.01	0.35 / 0.40	0.036		0.01	41	0.66	51.4 / 1.6	31.4 / 1.1	4	5
1.30F	LN6755				0.9	1.8 db / 1.8 daf	27.1 / 27.8 daf	70.2 / 72.2	87.2 / 89.6	5.2 / 5.3	2.6 daf / 2.9	1.7 / 1.8	0.4 / 0.4	35.75 daf / 36.72		0.44 / 0.45	0.03 daf / 0.03	0.41 / 0.42									

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Corrimal
Kemira Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. / Bulli seam	42		2.02	CSIROLR224	CCC'	LN7636 1.99	CSIROLR224	100	25 / 25	37 / 38	38 / 39	2											

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	LN7636	CSIROLR224	100	1.38	0.9	12.0 db / 12.1	23.1 / 26.6 daf	64.0 / 73.4	77.0 / 88.5	4.3 / 5.0	4.2 daf / 4.6	1.3 / 1.5	0.3 / 0.4	31.03 daf / 35.65	3½	0.34 / 0.34	0.09 daf / 0.10	0.25 / 0.29	0.047		0.01	1	0.26	55.2 / 1.6	35.4 / 1.1	10	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Unanderra
Huntley and Avondale Collieries

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra Coal Measures — measured section Huntley Colliery: Bulli seam			2.25	CSIROLR92																			
Balgownie seam			1.25																				
Wongawilli seam			10.35																				
Tongarra seam	~120.00 / 45 / 121.51		1.61	LR218	MS'	LN7417 1.51	LR219	100	23 / 24	35 / 37	37 / 39	5											
Wongawilli seam	~240.00 / 65 / 245.51		3.31	LR212	CCC'	LN6807 3.18	LR212	100	46 / 44	49 / 51	14 / 20	6											
Tongarra seam	~300.00 / 44 / 302.16		2.16	LR211	CCC'	LN6729 2.15	LR211		29 / 30	27 / 28	40 / 42	4											

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
MS'	LN7417 1.51	CSIRO LR219	100	1.44	0.8	17.4 db / 17.5	24.0 / 29.3 daf	57.6 / 70.7 vitrain analysis	70.6 / 86.4	4.1 / 5.1	5.2 daf / 6.1	1.4 / 1.7	0.5 / 0.7	28.66 daf / 35.07	4½	0.42 / 0.76	0.16 daf / 0.17	0.48 / 0.59	0.010		0.01	60	0.98	64.1 / 1.7	31.0 / 1.1	20	7
1.30F	LN7476				0.7	5.4 db / 4.4	30.9 / 31.7 daf	63.5 / 68.3	85.9 / 87.4	5.2 / 5.6	4.3 daf / 4.7	1.6 / 1.6	0.8 / 0.9	35.01 daf / 36.54		0.84 / 0.88	0.06 daf / 0.06	0.78 / 0.81	0.005		0.00		0.00				
CCC'	LN6807 3.18	CSIRO LR212	100	1.42	1.3	19.7 db / 19.4	25.1 daf / 31.8	53.9 / 68.2 vitrain analysis	68.7 / 86.4	4.5 / 5.4	4.0 daf / 5.1	1.4 / 2.0	0.4 / 0.6	28.24 daf / 35.75	7½	0.44 / 0.56	0.15 daf / 0.19	0.29 / 0.37	0.006		0.01	<1	0.42	70.0 / 2.9	29.4 / 1.1	60	6
1.30F	LN6806				1.5	3.3 db / 3.2 daf	31.1 daf / 47.4	64.2 / 96.8	83.9 / 88.0	5.3 / 6.5	5.7 daf / 8.6	1.9 / 2.0	0.6 / 0.9	24.87 daf / 36.96	9	0.58 / 0.61	0.00 daf / 0.00	0.58 / 0.61	0.002		0.00		0.04				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Unanderra
Kembla Mt. Bore DDH 1

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. / Woonona seam	70.69 / 73.28		2.59	CSIRO LR92																			

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	LN1581 2.24	CSIRO LR92		1.55	1.3	23.7 db / 24.0	19.1 daf / 26.3	55.9 / 74.5	65.6 / 87.4	3.5 / 4.7	4.3 daf / 5.7	1.2 / 1.7	0.4 / 0.5	25.89 daf / 34.51	1	0.39 / 0.52	0.11 daf / 0.15	0.28 / 0.37	0.009		0.01	1	0.12	57.8 / 1.8	31.1 / 1.1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Unanderra
Kembla Mt. Bore DDH 1

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vl+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra C.M. / Woonona seam	70.69 / 73.28		2.59	CSIRO LR92																			

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	LN1581 2.24	CSIRO LR92		1.55	1.3	23.7 db / 24.0	19.1 daf / 26.3	55.9 / 74.5	65.6 / 87.4	3.5 / 4.7	4.3 daf / 5.7	1.2 / 1.7	0.4 / 0.5	25.89 daf / 34.51	1	0.39 / 0.52	0.11 daf / 0.15	0.28 / 0.37	0.009		0.01	1	0.12	57.8 / 1.8	31.1 / 1.1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Albion Park
Mount Murray Bores No 10 and 11

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
Bulli seam	220.25		0.10	CSIRO LR64
	221.65			
Balgownie seam	230.05		0.16	
	230.21			
	296.87		3.26	
Wongawilli seam				
	298.13			CSIRO LR 98
American Creek seam				
	322.45		2.16	
Tonagrra seam				
	324.61			
	326.66		0.82	CSIRO LR64
Woonona? seam	327.46			

MICROLITHOTYPE - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD-DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
C	0.10	CSIRO LR64	45	1.93	1.8	3.1 db 3.17	9.3 daf 13.4	57.8 daf 86.1						19.70 daf 29.55		0.16 daf 0.24											
A	0.16		85	1.58		14.0																				
CCC'	3.03	CSIRO LR98		1.54	1.1	31.0 db 31.3	23.4 daf 34.2	44.5 daf 65.5						23.06 daf 33.96	3½	0.41 daf 0.60										
CCC'	2.12		90	1.49	1.0	21.7 db 21.9	24 daf 31.2	53.2 daf 68.8						27.10 daf 35.05	2½	0.56 daf 0.72										
WS'	0.82			1.70	1.1	39.1 db 39.5										0.28 daf 0.47										

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Tahmoor
D.M. Bore 27 (Wollongong)

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
Bulli seam	425.98		1.94	CSIRO LR332
	23			
	426.61			
Balgownie seam	435.86		0.37	
	436.23			
	439.73			
	440.03			
	445.39			
	445.93			
Wongawilli seam	460.71		2.13	CSIRO LR332
	64			
	462.84			
	463.48			
American Creek seam	487.44			
	506.26			
Tangarra seam	62		1.50	GSNSW
	507.85			
	510.70			
	513.11			
Woonona seam	571.59			absent in this section
Pheasants Nest Fm				
	581.37			
	589.77			
	591.60			
	601.30			
	623.17			

MICROLITHOTYPE - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD-DC	I	SC+MM
WS'	LN18340 0.94			6	28 maf 30	58 62	6
CCC'	LN18341 0.37			6 9	21 maf 24	58 67	13
CCC'	LN18345 1.86	CSIRO LR332	43 31	19 maf 23	22 24		16
CCC'	LN18462 0.88	CSIRO LR332	62 49	22 maf 26	22 24		14

MACERAL - VOL %

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number - Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
WS'	LN18340 0.94			1.39	1.0	13.1 db 15.2	21.4 daf 24.9	64.5 daf 75.1	75.7 88.1	4.0 4.7	4.5 daf 5.3	1.4 1.6	0.3 0.3	30.54 daf 36.54	1½	0.28 0.03	0.07 daf 0.02	0.24 0.31	0.03		0.00	41	0.63	33.7 1.7	31.4 1	4	7
CCC'	LN18341 0.37			1.53	0.9	30.0 db 35.3	16.7 daf 24.2	52.4 daf 76.8	61.6 68.4	3.2 4.6	3.5 daf 5.1	1.1 1.6	0.2 0.3	32.31 daf 36.24	1½	0.29 0.42	0.02 daf 0.03	0.27 0.39	0.017		0.00.4		0.56	83.3 7.8	10.7 1	10	5
CCC'	LN18345 1.86	CSIRO LR332		1.41	0.9	25.1 db 29.3	21.5 daf 29.0	52.5 daf 71.0	64.5 81.2	3.7 5.0	4.1 daf 5.5	1.4 1.9	0.3 0.4	24.05 daf 33.24	6	0.47 0.44	0.06 daf 0.08	0.41 0.54	0.013		0.00.4		2.20	44.3 4.4	14.9 1	20	9
CCC'	LN18462 0.88	CSIRO LR332		1.44	1.1	19.9 db 20.1	22.4 daf 28.3	56.6 daf 71.7	68.2 86.4	3.7 4.7	5.3 daf 6.7	1.4 1.7	0.4 0.5	27.42 daf 34.72	7	0.54 0.48	0.17 daf 0.15	0.42 0.55	0.051		0.02.28		3.57	54.1 4.2	13.0 1	8 30	5 20

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Darkes Forest
Bore DM 61 (Camden)

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures	524 13			
Bulli seam	39		3.23	CSIRO LR331
	552 36			
	560 04			
Balgownie seam	37		1.88	
	597 22			
	650 81			
	651 39			
Woronora seam	681 44			
	681 94			
	692 91			
Wongawilli seam				GSNSW
	602 89			
	613 74			
American Creek seam				
	630 15			
	669 34			
Tongarra seam	57		1.84	CSIRO LR331
	671 29			
	681 91			
Woonona seam	36		1.45	
	686 51			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
CCC	LN11022 319	CSIRO LR331		21	32 mmf 33	44 mmf 45	3
				22			
CCC	LN11435 381	CSIRO LR331		21	28 mmf 29	48	3
				22		44	1
US	LN18460 176	CSIRO LR331		4	19 mmf 27	68	9
				4		76	
TS	LN18483 135	CSIRO LR331		12	34 mmf 45	34	13
				14		41	
CCC	LN18450 127	CSIRO LR331		31	26 mmf 33	21	22
				40		27	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	V	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN11022 319	CSIRO LR331		1.35	1.1	11.4 db 11.5	19.2 daf 21.9	68.3 daf 78.1	77.9	4.0	4.0 daf 4.6	1.4	0.2	31.15 daf 35.56	3	0.31	0.03 daf 0.35	0.28 daf 0.32	0.042			0.00	<1	1.44	46.8 15	50.3 1	3	3
CCC	LN11435 381	CSIRO LR331		1.40	1.0	13.8 db 15.9	18.6 daf 21.8	66.6 daf 78.2	76.1	3.8 daf 4.2	3.7 daf 4.1	1.4	0.2	30.40 daf 35.68	2	0.36	0.09 daf 0.42	0.27 daf 0.31	0.005			0.02	<1	2.08	45.9 20	22.5 1	4	3
CCC	LN18450 127	CSIRO LR331		1.50	1.3	25.4 db 26.2	15.5 daf 17.6	59.5 daf 81.4	65.2	3.2 daf 4.5	2.7 daf 3.6	1.3	0.4	26.14 daf 35.89	1	0.52	0.14 daf 0.69	0.36 daf 0.49	0.062			0.01	12	1.08	32.4 53	13.7 1	40	20
US	LN18480 176	CSIRO LR331		1.50	1.5	23.4 db 23.8	15.7 daf 18.2	61.4 daf 81.8	67.2	3.1 daf 4.1	3.2 daf 4.3	1.3	0.3	26.45 daf 35.22	<1	0.44	0.13 daf 0.59	0.31 daf 0.41	0.006			0.02	3	1.56	40.3 29	20.6 1	7	7
TS	LN18483 135	CSIRO LR331		1.51	1.6	24.0 db 24.4	12.9 daf 17.3	61.5 daf 82.7	67.0	3.2 daf 4.2	2.5 daf 3.4	1.3	0.4	26.45 daf 35.54	<1	0.49	0.19 daf 0.66	0.30 daf 0.40	0.007			0.02	1	0.44	44.7 32	20.5 1	10	7

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Albion Park
Tongarra Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra C.M.	~200 00			
Wongawilli seam	63		2.27	CSIRO LR203 and LR202
	262 27			
	~200 00			
Tongarra seam	44		1.08	
	307 08			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
CCC	LN6345 210	CSIRO LR203 and LR202	100	44	30 mmf 32	19	7
				47		21	
CCC	LN6356 108	CSIRO LR203 and LR202	100	26	34 mmf 35	38	2
				26		39	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	V	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE B ppm ad	TRACE Ga ppm ad
CCC	LN6345 210	CSIRO LR203 and LR202	100	1.46	1.1	22.8 db 23.1	25.5 daf 39.5	50.6 daf 46.5	65.6	4.1 daf 6.4	4.7 daf 6.1	1.6	0.4	26.47 daf 34.62	5	0.46	0.17 daf 0.61	0.29 daf 0.38	0.006			0.01	<1	0.86	72.4 3.4	20.2 1	60	6
130F	LN6344				1.6	3.1 db 3.2	34.1 daf 32.6	62.8 daf 67.4	83.4	5.2 daf 6.5	4.2 daf 4.4	1.9	0.6	34.38 daf 36.09	8½	0.44 daf 0.67	0.02 daf 0.02	0.82 daf 0.65				0.01		0.02				
CCC	LN6356 108	CSIRO LR203 and LR202	100	1.65	1.2	17.3 db 17.5	22.4 daf 27.4	59.1 daf 72.6	71.6	4.1 daf 5.0	3.9 daf 4.9	1.4	0.5	28.87 daf 35.40	1½	0.52	0.01 daf 0.64	0.51 daf 0.63	0.006			0.00	<1	0.44	72.8 3.6	20.3 1	25	7
130F	LN6355				1.2	4.2 db 4.3	32.8 daf 34.7	61.1 daf 65.3	82.8	5.2 daf 6.6	3.8 daf 4.1	1.9	0.7	34.29 daf 36.29	9	0.76	0.06 daf 0.76	0.64 daf 0.68				0.08		0.06				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Unanderra
Nebo Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra C.M.	178 31			
Wongawilli seam	69		2.43	CSIRO LR214
	179 24			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
CCC	LN7177 241	CSIRO LR214		52	26 mmf 28	16	6
				55		17	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	V	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	S P+S	S O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	ASH Al_2O_3 %	TRACE R ppm ad	TRACE Ga ppm ad
CCC	LN7177 241	CSIRO LR214	100	1.42	1.1	1.8 db 1.9	25.0 daf 36.5	57.8 daf 63.5	70.6	4.3 daf 5.4	3.9 daf 4.7	1.4	0.4	28.80 daf 35.61	8½	0.44	0.01 daf 0.57	0.39 daf 0.48	0.005			0.01	3	0.91	60.9 23	26.8 1	20	7
130F					1.0	2.5 db 2.5	27.2 daf 26.2	69.3 daf 71.8	86.1	5.1 daf 5.3	2.8 daf 2.9	1.7	0.6	34.15 daf 35.16	>9	0.60	0.02 daf 0.62	0.58 daf 0.60	0.02			0.00		0.02				

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Berrima

Black Bobs Creek and Southern Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra CM	0.00			CSIRO LR 230, 100 and LR80		Black Bobs Ck No 3 Exploratory Heading																	
Wongawilli Seam	2.25		2.25																				
	2.25																						
	51.00																						
American Creek? Seam	34		1.70		ccc'	LN8041		100	14	35 mmf 15	46 37	5 88		Southern Colliery									
	52.70																						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc'	LN1360 1.94	CSIRO LR80 and LR30	100	1.41	2.1	16.2 (db) 16.5	32.9 (daf) 40.3	48.8 (daf) 59.7	68.1 (daf) 85.3	4.6 (daf) 5.6	7.1 (daf) 8.6	1.4 (daf) 1.8	0.6 (daf) 0.7	27.82 (daf) 34.05	4	0.63 (db) 0.65	0.02 (daf) 0.02	0.51 (daf) 0.63			0.02	<1	0.04	64.4 2.0	32.1 1.1		
ccc'	LN8041 1.58		100	1.48	1.6	22.1 (db) 22.5	25.1 (daf) 32.8	51.2 (daf) 67.2	64.3 (daf) 84.2	4.0 (daf) 5.3	5.6 (daf) 7.4	1.4 (daf) 1.8	1.0 (daf) 1.3	26.33 (daf) 34.49	1	0.97 (db) 1.27	0.51 (daf) 0.67	0.46 (daf) 0.60	0.007		0.08	22	0.08	14.0 3.7	19.9 1.1	10	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Berrima

Mount Misery DDH No 1

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra CM	139.09			CSIRO LR239			CSIRO LR239							mildly metamorphosed.									
Wongawilli Seam	69		4.43		ccc'	LN8456 4.32			47 53	27 mmf 31	14 16	12											
	143.52																						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc'	LN8456 4.32	CSIRO LR239		1.49	1.3	28.9 (db) 24.3	22.0 (daf) 31.6	47.8 (daf) 68.4	59.6 (daf) 85.4	3.8 (daf) 5.4	4.6 (daf) 6.6	1.4 (daf) 2.0	0.4 (daf) 0.6	23.96 (daf) 34.36	1	0.16 (db) 0.66	0.08 (daf) 0.11	0.38 (daf) 0.55	0.009		0.09	<1	0.34	78.1 4.6	16.9 1.1	60	6

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Mittagong

South Main Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra CM	167.65			CSIRO LR197		metamorphosed coal																	
Wongawilli Seam	1.79		1.79																				
	169.43																						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc'	LN6442 1.79	CSIRO LR197		1.50	1.6	20.0 (db) 25.5	5.8 (daf) 7.4	72.6 (daf) 92.6	71.9 (daf) 91.7	2.5 (daf) 3.2	1.9 (daf) 2.4	1.5 (daf) 2.0	0.6 (daf) 0.7	27.33 (daf) 34.89		0.58 (db) 0.74	0.02 (daf) 0.04	0.55 (daf) 0.70	0.004		0.04	12	0.09	69.3 3.0	23.4 1.1	100	10

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Mittagong

Wanganderry Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra CM	152.40			CSIRO LR188																			
Wongawilli? Seam	1.89		1.89																				
	154.29																						

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc'	LN5573 1.70	CSIRO LR188	100	1.50	2.0	25.3 (db) 25.8	26.7 (daf) 36.7	46.0 (daf) 63.3	60.8 (daf) 83.7	4.0 (daf) 5.5	6.0 (daf) 8.2	1.3 (daf) 1.8	0.6 (daf) 0.8	24.75 (daf) 34.05	2½	0.61 (db) 0.84	0.17 (daf) 0.25	0.44 (daf) 0.61	0.006		0.09	7	0.85	68.2 30	23.1 1	20	5

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Berrima

Berrima Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit %, mmf	Section	Thickness	Source	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM	Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM	Sample type	Sample Number	Source	R_o max
Illawarra CM	60.00			CSIRO LR234			CSIRO LR234																
Wongawilli Seam	6.6		2.34		ccc'	LN8182 2.19		100	46	32	15	7											
	62.34								49	34	17												

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	O	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
ccc'	LN8182 2.19	CSIRO LR234	100	1.45	1.4	22.8 (db) 23.1	28.0 (daf) 36.4	47.8 (daf) 63.1	65.4 (daf) 83.7	4.2 (daf) 5.5	6.3 (daf) 8.3	1.4 (daf) 1.8	0.5 (daf) 0.7	25.07 (daf) 34.40	5½	0.54 (db) 0.71	0.05 (daf) 0.07	0.44 (daf) 0.65	0.007		0.09	7	0.04	73.6 3.2	22.7 1	50	7

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION : Rylstone
DMR Kelgoola DDH 3

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
	188.56			
No1 Katoomba seam	29		3.54	NSW DMR
	191.40			
	210.49			
No2 Unnamed seam	39		0.65	
	211.64			
	212.65			
No3 Woodford seam	60		1.59	
	214.24			
	219.05			
No4 Middle River seam	69		7.54	
	226.59			
	232.41			
No5 Moolarben seam	79		1.44	
	235.85			
	303.67			
No6 Wolgan seam	76		3.26	
	306.93			
	378.60			
No7 Lidsdale seam	70		1.98	
	380.58			
	389.35			
No8 Lithgow seam	44		7.15	
	386.80			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
rc	PN35207			8	11	41	41
ws	3.54			14	14	45	
rc	PN35208			13	18	22	47
ws	0.65			18	24	58	
rc	PN35209			24	11	22	44
ws	1.59			42	19	39	
rc	PN35210			8	1	6	85
ws	7.54			54	7	39	
rc	PN35211			62	13	14	11
ws	1.44			70	15	15	
rc	PN35212			27	5	5	62
ws	3.26			72	14	14	
rc	PN35213			25	15	14	46
ws	1.98			47	27	26	
rc	PN35214			18	34	35	13
ws	7.15			21	39	40	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
rc	PN35207			17	44	39
ws	3.54			28	72	
rc	PN35208			29	45	26
ws	0.65			39	61	
rc	PN35209			38	25	37
ws	1.59			60	40	
rc	PN35210			24	11	65
ws	7.54			69	31	
rc	PN35211			66	12	13
ws	1.44			79	21	
rc	PN35212			45	14	41
ws	3.26			76	24	
rc	PN35213			42	18	40
ws	1.98			70	30	
rc	PN35214			35	46	19
ws	7.15			44	56	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
rc	PN35207		
ws	3.54		
rc	PN35208		
ws	0.65		
rc	PN35209		
ws	1.59		
rc	PN35210		
ws	7.54		
rc	PN35211		
ws	1.44		
rc	PN35212		
ws	3.26		
rc	PN35213		
ws	1.98		
rc	PN35214		
ws	7.15		

CSIRO 1R1375R

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Putty
Wancol Putty DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures	491.79			
	492.25			
	501.64			
	503.32		1.68	
	525.35			
	526.27		0.92	
	543.54			
	548.00		4.46	Coalex Wancol Putty DDH1
	562.60			
	563.46			
	581.31		2.02	
	583.33			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: DM Upper Cold DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
	691.35			
No2 seam			1.524	
	692.87			
	705.43			
No3 seam			1.624	
	707.55			
	728.30			
No4 seam			3.01	
	728.31			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Putty
Wancol Putty DDH 1

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
rc	LN83115			
ws	3.54			
rc	LN83176			
ws	0.65			
rc	LN83177			
ws	1.59			
rc	LN83178			
ws	7.54			
rc	LN83179			
ws	1.44			
rc	LN83180			
ws	3.26			
rc	LN83181			
ws	1.98			
rc	LN83182			
ws	7.15			

PROXIMATE wt % ad

M	A	VM	FC
3.7	27.0 / 28.0	21.6 / 31.1	47.9 / 68.9
3.4	27.9 / 23.7	23.0 / 31.4	50.3 / 68.6
3.4	23.4 / 24.2	24.1 / 32.9	49.1 / 67.1
3.2	29.0 / 30.0	25.2 / 37.2	42.6 / 62.8
3.5	19.9 / 20.6	29.3 / 38.2	47.4 / 61.8
2.8	26.2 / 27.0	26.9 / 37.9	44.1 / 62.1
3.1	16.2 / 16.7	28.1 / 34.8	52.7 / 66.2
3.5	19.1 / 19.8	29.9 / 32.2	52.5 / 67.8

ULTIMATE wt % ad

C	H	O	N	S
			1.2 daf	
			1.7	
			1.3 daf	
			1.8	
			1.4 daf	
			1.9	
			1.3 daf	
			1.9	
			1.5 daf	
			2.0	
			1.6 daf	
			2.3	
			1.8 daf	
			2.2	
			1.6 daf	

SE MJ/kg

CSN

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.34 / 0.50	0.07 daf / 0.03	0.32 / 0.47	0.007				0.19
0.41 / 0.56	0.01 daf / 0.01	0.40 / 0.55	0.03				0.19
0.57 / 0.78	0.02 daf / 0.03	0.55 / 0.75	0.013				0.14
0.53 / 0.78	0.01 daf / 0.01	0.52 / 0.77	0.003				0.28
0.55 / 0.72	0.02 daf / 0.03	0.53 / 0.69	0.004				0.45
0.49 / 0.69	0.01 daf / 0.01	0.48 / 0.68	0.127				0.35
0.49 / 0.61	0.01 daf / 0.01	0.48 / 0.60	0.068				0.09
0.44 / 0.57	0.01 daf / 0.01	0.43 / 0.56	0.031				0.10

ASH

SiO_2 %	Al_2O_3 %
81.1 / 2.6	13.7 / 1
84.5 / 7.8	10.8 / 1
89.9 / 14.0	6.4 / 1
90.0 / 14.3	6.3 / 1
77.5 / 5.3	14.6 / 1
91.4 / 18.6	4.9 / 1
82.2 / 7.1	11.6 / 1
81.2 / 5.8	14.0 / 1

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Putty
Wancol Putty DDH 1

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
cc	2920 – 2924	Coalex Wancol Putty DDH1		
ws	1.68			
cc	2920 – 2924			
ws	1.68			
cc	3678 – 3680			
ws	0.92			
cc	3640 – 3701			
ws	4.46			
cc	3640 – 3701			
ws	4.46			

PROXIMATE wt % ad

M	A	VM	FC
1.6	13.0	33.3	51.6
	db	daf	
2.4	7.0	35.6	55.0
	db	daf	
	7.2	39.2	60.8
1.8	15.8	32.6	49.8
	db	daf	
	16.1	39.3	60.7
1.7	16.2	31.6	50.5
	db	daf	
	16.6	38.5	61.5
2.2	4.0	34.3	59.5
	db	daf	
	4.2	38.6	61.4

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg

31.12	5
36.65	
30.08	54
34.28	
28.11	34
33.81	
28.10	42
34.23	
30.44	74
34.84	

CSN

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.46							
0.34							
0.32							
0.57							
0.44							
0.45							
0.31							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS of EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: DM Upper Cold DDH 1

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ws	0.92 / 6832		1.36	
rc	1.52			
rc	GS1970 / 6832-33		1.42	
ws	1.62			
rc	GS1970 / 6832		1.54	
ws	3.01			

PROXIMATE wt % ad

M	A	VM	FC
1.3	10.1	34.6	54.0
	db	daf	
	10.1	39.1	60.9
1.2	15.1	34.5	49.2
	db	daf	
	15.3	35.0	55.0
1.3	11.2	30.6	55.4
	db	daf	
	12.3	35.4	64.6

ULTIMATE wt % ad

C	H	O	N	S

SE MJ/kg

30.73
34.68
29.07
37.81
30.05
34.74

CSN

MINOR wt % ad

S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
0.35							
0.35							
0.55							
0.86							
0.35							
0.40							

ASH

SiO_2 %	Al_2O_3 %

TRACE

B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Newnes
Wancol Lithgow DDH 14 and 19 , Newnes DDH 2 and DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
Katoomba Upper seam	69.10		0.63	Wancol Lithgow DDH 19
	69.73			
	71.95		2.06	
Katoomba Lower seam				
	74.01			
	89.32		1.64	
Middle River seam				
	90.96			
	77.44			Coalex
	78		2.09	DDH2
Wolgan seam				
	79.53			
	91.32			
	39		88	Wancol Newnes DDH 1
	92.10			
?Lithgow seam				
	103.27		91	
	37			
	104.18			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM
ccc	PN8625	CSIRO IR 532R	90	58	23	8	11
ws	2.09			65	26	9	
ccc	PN7899 · 7902			13	47	34	6
ws	0.88			14	50	36	
ccc	PN7910 · 7911			16	37	40	7
ws	0.91			17	40	43	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max
ccc	PN8625		0.79
ccc	PN7899 · 7901		0.94
ccc	PN7910 · 7911		0.91

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	2.082	Wancol Lithgow DDH 19	93	
ws	0.63			
ccc	2.090 · 2.092		47	
ws	2.06			
145R	2.090			
ccc	2.098 · 2.102		88	
ws	1.64			
145R	2.096 · 2.108		41	
ws	1.64			
ccc	8616 · 8626	Newnes DDH 2	90	
ws	2.09			
145R	8616 · 8626			
ccc	8906 · 8908	Lithgow DDH 14	92	
ws	0.78			
145R	8904 · 8908		92	
ccc	8914		93	
ws	0.60			

PROXIMATE wt % ad

Sample type	M	A	VM	FC
ccc		19.4		
	2.6	19.3	26.9	51.4
		db	daf	
		14.8	34.1	65.6
	3.0	10.4	30.5	56.1
		db	daf	
		10.7	35.1	64.8
ccc	2.5	24.3	27.3	45.9
		db	daf	
		24.9	37.3	62.7
ws	2.5	13.5	31.4	55.1
		db	daf	
		15.8	37.4	62.6
ccc	2.4	14.8	39.4	45.8
		db	daf	
		16.2	41.5	58.5
ws	2.3	8.4	36.2	55.4
		db	daf	
		9.7	40.8	59.2
ccc	2.5	13.9	26.2	57.4
		db	daf	
		16.3	31.7	68.8
	2.7	9.2	27.7	63.0
		db	daf	
		9.9	31.7	68.3
ccc	2.1	28.9	24.3	44.7
		db	daf	
		29.5	35.2	64.8

ULTIMATE wt % ad

Sample type	C	H	O	N	S
ccc	71.9	4.5	17.9	1.5	0.3
		daf			
	83.5	5.2	9.2	1.7	0.4

SE MJ/kg

Sample type	SE MJ/kg
ccc	26.21
	daf
ws	32.52
ccc	24.52
	daf
	33.87
	24.68
	daf
	34.27
ccc	25.10
	daf
	34.29
ws	29.08
	daf
	34.62
ccc	29.42
	daf
ws	35.53
	31.96
	daf
	35.99
ccc	28.89
	daf
ws	34.39
	30.38
	daf
	34.72
ccc	23.38
	daf
ws	33.86

CSN

Sample type	CSN
ccc	
ws	
ccc	1
ccc	1
ws	34
ccc	74
ws	
ccc	
ws	

MINOR wt % ad

Sample type	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
ccc	0.33					0.09		0.04
	daf							
ws	0.38							
	0.24							
	0.37			0.039				
	daf							
	0.41							
ccc	0.50							
	daf							
	0.77							
	0.66			0.036				
	daf							
	0.79							
ccc	0.56							
	daf							
ws	0.88							
	0.99							
	daf							
	0.68							
ccc	0.50							
	daf							
ws	0.80							
	0.84							
	daf							
	0.94							
ccc	0.57					0.02		
	daf							
ws	0.93			0.056				
	daf							
	0.64							
ccc	0.47					0.02		
	daf							
ws	0.62							
	0.51			0.04				
	daf							
	0.69							

ASH

Sample type	SiO_2 %	Al_2O_3 %
ccc	59.6	34.5
ws	19.1	

TRACE

Sample type	B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Clarence
Wancol Lithgow DDH 16 and Coalex BP Clarence DDH 14

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
Katoomba seam	278.01		4.16	Coalex - BP Clarence DDH14
	282.17			
Middle River seam	295.57		2.22	
	297.80			
	356.57		1.23	
	359.60			
Lithgow seam	397.44		2.90	
	400.34			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vit+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD
ccc	9163 · 9172	Coalex - BP Clarence DDH14	90	
ws	4.16			
145R	9163 · 9172		73	
ccc	9176 · 9193		94	
ws	2.22			
145R	9176 · 9183		69	
ws	2.22			
ccc	9186 · 9188		91	
ws	1.23			
145R	9186 · 9188		86	
ws	1.23			
ccc	9192 · 9202		91	
ws	2.90			
145R	9192 · 9202		75	
ws	2.90			

PROXIMATE wt % ad

Sample type	M	A	VM	FC
ccc	2.0	13.9	27.0	59.1
		daf		
ws		14.2	31.4	68.6
145R	2.5	9.4	28.1	62.5
		db	daf	
		9.6	31.0	69.0
ccc	2.2	26.2	27.0	46.8
		db	daf	
ws		26.8	34.0	65.4
145R	2.0	14.8	22.4	51.8
		db	daf	
ws		20.2	35.4	64.6
ccc	2.2	10.3	32.3	57.4
		db	daf	
ws		10.7	34.0	60.5
145R	2.0	8.3	33.2	58.5
		db	daf	
ws		8.5	36.2	63.8
ccc	2.2	25.7	25.0	51.3
		db	daf	
ws		24.2	32.8	67.2
145R	1.9	20.6	25.4	56.0
		db	daf	
ws		21.0	32.0	68.0

ULTIMATE wt % ad

Sample type	C	H	O	N	S
ccc	79.1	4.5	7.9	1.5	0.3
		daf			
ws	83.5	5.2	9.2	1.7	0.4

SE MJ/kg

Sample type	SE MJ/kg
ccc	28.50
	daf
ws	33.10
	30.9
	daf
	33.11
ccc	25.58
	daf
ws	34.66
	27.98
	daf
	34.84
ccc	31.38
	daf
ws	35.21
	32.37
	daf
	35.25
ccc	26.40
	daf
ws	34.60
	27.96
	daf
	34.84

CSN

Sample type	CSN
ccc	1
ws	
ccc	2
ws	32
ccc	74
ws	9
ccc	1
ws	1

MINOR wt % ad

Sample type	S: TS	S: P+S	S: O	P	F	Cl	As ppm	CO_2
ccc	0.33					0.09		0.04
	daf							
ws	0.38							
	0.37			0.039				
	daf							
	0.41							
ccc	0.55					0.07		
	daf							
ws	0.75							
	0.61			0.036				
	daf							
	0.76							
ccc	0.57					0.02		
	daf							
ws	0.93			0.056				
	daf							
	0.64							
ccc	0.47					0.02		
	daf							
ws	0.62							
	0.51			0.04				
	daf							
	0.69							

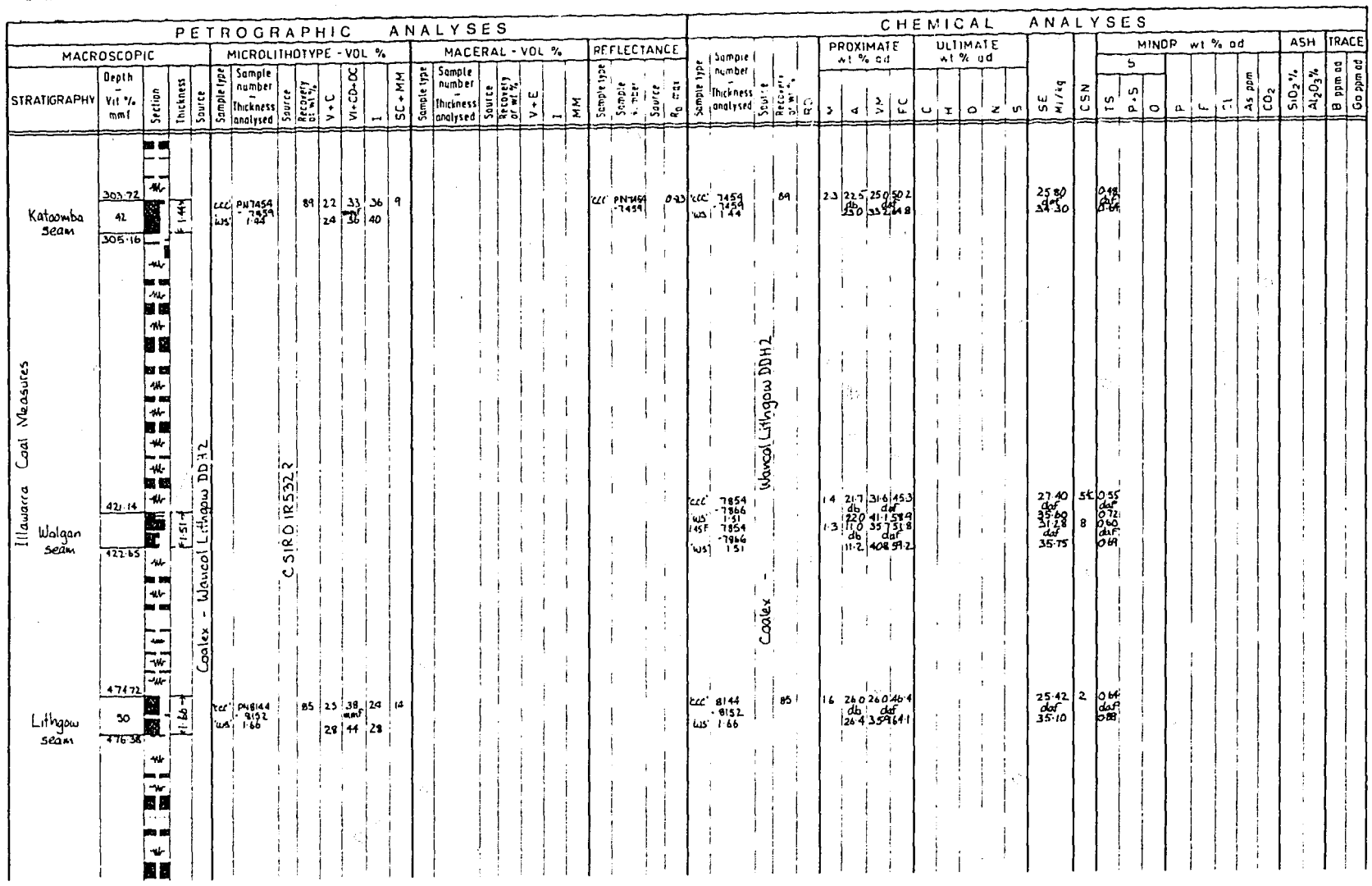
ASH

Sample type	SiO_2 %	Al_2O_3 %
ccc	59.6	34.5
ws	19.1	

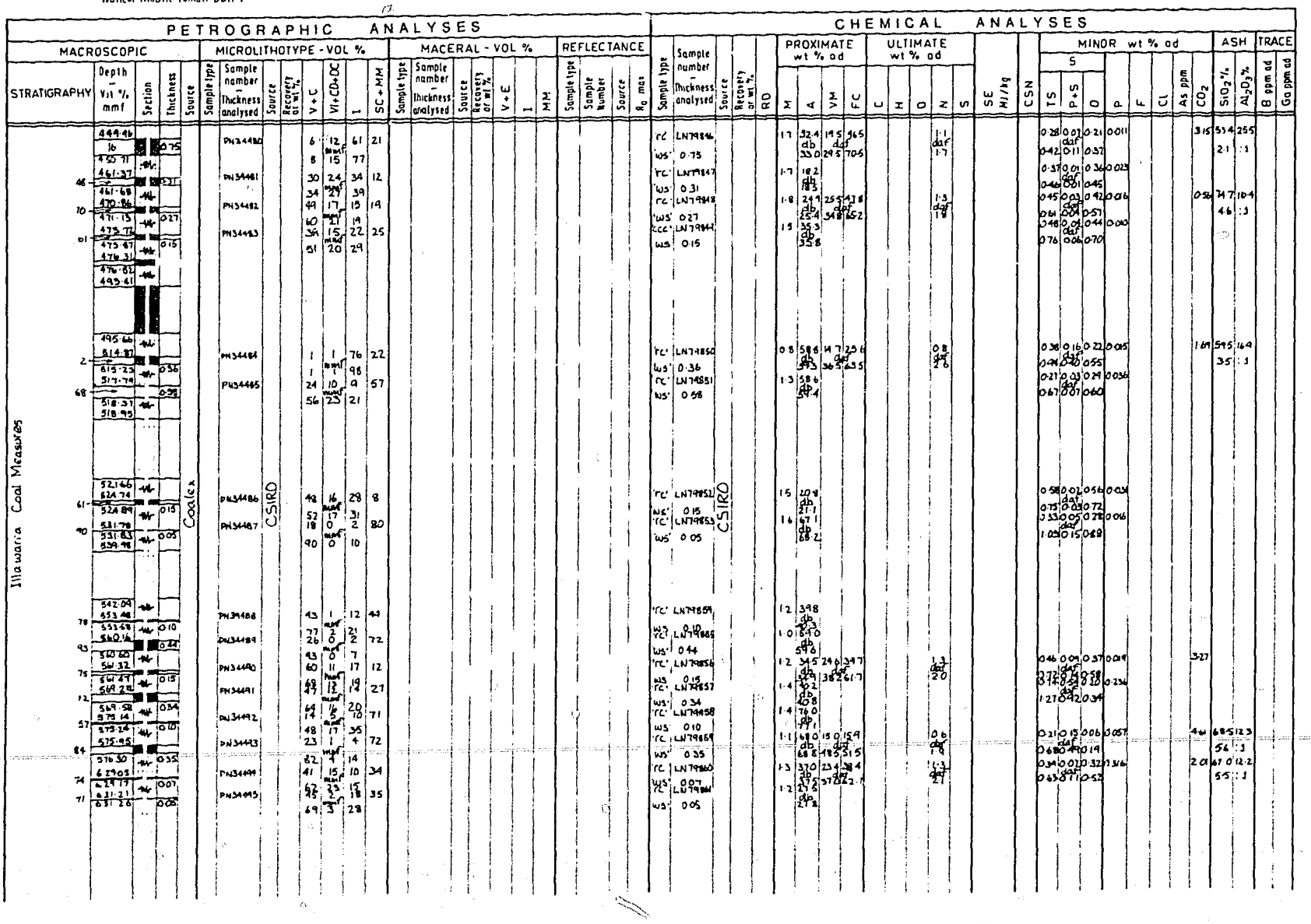
TRACE

Sample type	B ppm ad	Ga ppm ad

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Wancol Lithgow DDH 2



PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Mount Tomah
Wancol Mount Tomah DDH 1



PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Lithgow
Wallerawang CD DDH 2 , 4 and 6 , and Red Springs Open Cut

PETROGRAPHIC ANALYSES

MACROSCOPIC: STRATIGRAPHY; Depth – Vit % mmf; Section; Thickness; Source
MICROLITHOTYPE - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+C; Vt+CD+DC; I; SC+MM
MACERAL - VOL %: Sample type; Sample number – Thickness analysed; Source; Recovery of wt %; V+E; I; MM
REFLECTANCE: Sample type; Sample Number; Source; R_o max

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Micro: Sample type	Micro: Sample number – Thickness analysed	Micro: Source	Micro: Recovery of wt %	Micro: V+C	Micro: Vt+CD+DC	Micro: I	Micro: SC+MM	Macer: Sample type	Macer: Sample number – Thickness analysed	Macer: Source	Macer: Recovery of wt %	Macer: V+E	Macer: I	Macer: MM	Refl: Sample type	Refl: Sample Number	Refl: Source	Refl: R_o max
Irondale seam	57.59		1.23	CSIROLR111, LR115 DDH6										1.452 1.395	Coalex DDH4		70 24 6 (mm%)			1.451	1.395		0.71
	54.32																74 26						
	26.0			Coalex Wallerawang Colliery Development DDH2																			
	42.47																						
?Lidsdale seam			1.09																				
Lithgow seam			1.24																				

Chem: Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	Prox wt % ad: M	A	VM	FC	Ult wt % ad: C	H	O	N	S	SE MJ/kg	CSN	Minor wt % ad: TS	P+S	O	P	F	Cl	As ppm	CO_2	Ash: SiO_2 %	Al_2O_3 %	Trace: B ppm ad	Ga ppm ad
'ccc'	9.488 – 9.498	Coalex DDH6	86		2.3	19.0 ab 12.5	32.8 daf 40.3	48.2 59.7						27.66 daf 34.19	4	0.58 daf 0.71											
'ws'	1.47																										
'ls'	9.488 – 9.498				2.0	11.2 ab 7.7	35.3 daf 41.0	53.5 59.3						29.65 daf 34.39	5	0.82 daf 0.95											
'ws'	1.47																										
	LN661-59 1.09	CSIROLR111, LR115	100	1.54	4.6	22.1 ab 23.2	28.4 daf 36.7	44.9 61.3						22.98 daf 31.36	1	0.65 daf 0.73											
'us'	LN758 0.76		100	1.45	2.7	16.5 ab 14.9	32.9 daf 39.7	48.4 60.3	68.1	4.4	8.2 daf 4.9	1.5	0.6	27.82 daf 33.61	1	0.62 daf 0.75	0.01	0.61	0.004		0.01	4	0.03	58.0	38.9	1.5	1
'ls'	LN757 1.24		100	1.42	2.9	11.3 ab 11.6	32.7 daf 38.1	51.1 61.9	70.9	4.4	8.4 daf 4.9	1.5	0.6	28.84 daf 33.61	1	0.62 daf 0.72	0.05	0.57	0.006		0.04	6	0.04	46.2	31.2	1.7	1

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: West
Ben Bullen Open Cut

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Micro: Sample type	Micro: Sample number – Thickness analysed	Micro: Source	Micro: Recovery of wt %	Micro: V+C	Micro: Vt+CD+DC	Micro: I	Micro: SC+MM	Macer: Sample type	Macer: Sample number – Thickness analysed	Macer: Source	Macer: Recovery of wt %	Macer: V+E	Macer: I	Macer: MM	Refl: Sample type	Refl: Sample Number	Refl: Source	Refl: R_o max
Lithgow seam			1.34	CSIROLR47																			

Chem: Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	Prox wt % ad: M	A	VM	FC	Ult wt % ad: C	H	O	N	S	SE MJ/kg	CSN	Minor wt % ad: TS	P+S	O	P	F	Cl	As ppm	CO_2	Ash: SiO_2 %	Al_2O_3 %	Trace: B ppm ad	Ga ppm ad
'ls'	LN754 1.36	CSIROLR47	100	1.39	2.5	12.4 ab 12.7	29.7 daf 33.2	55.4 66.8	70.4	3.0	6.6 daf 10.8	1.1	0.3	28.89 daf 33.45	1	0.34 daf 0.39	0.06	0.28	0.019		0.01	2	0.05	84.6 6.1	13.8 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: West
Steelworks Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Micro: Sample type	Micro: Sample number – Thickness analysed	Micro: Source	Micro: Recovery of wt %	Micro: V+C	Micro: Vt+CD+DC	Micro: I	Micro: SC+MM	Macer: Sample type	Macer: Sample number – Thickness analysed	Macer: Source	Macer: Recovery of wt %	Macer: V+E	Macer: I	Macer: MM	Refl: Sample type	Refl: Sample Number	Refl: Source	Refl: R_o max
Lithgow seam			1.66	CSIROLR107																			

Chem: Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	Prox wt % ad: M	A	VM	FC	Ult wt % ad: C	H	O	N	S	SE MJ/kg	CSN	Minor wt % ad: TS	P+S	O	P	F	Cl	As ppm	CO_2	Ash: SiO_2 %	Al_2O_3 %	Trace: B ppm ad	Ga ppm ad
'ls'	LN1962 1.46	CSIROLR107	100	1.38	2.2	11.9 ab 12.2	32.0 daf 37.3	55.9 62.7	72.7	4.8	6.1 daf 7.2	1.7	0.6	29.90 daf 34.80	1	0.58 daf 0.68	0.01	0.57	0.010			1.1	4	0.05	59.4 23.3	26.0 1	3.0	4

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: West
Kandos No 2 Colliery

PETROGRAPHIC ANALYSES

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source	Micro: Sample type	Micro: Sample number – Thickness analysed	Micro: Source	Micro: Recovery of wt %	Micro: V+C	Micro: Vt+CD+DC	Micro: I	Micro: SC+MM	Macer: Sample type	Macer: Sample number – Thickness analysed	Macer: Source	Macer: Recovery of wt %	Macer: V+E	Macer: I	Macer: MM	Refl: Sample type	Refl: Sample Number	Refl: Source	Refl: R_o max
Lithgow seam			1.99	CSIROLR114																			

Chem: Sample type	Sample number – Thickness analysed	Source	Recovery or wt %	RD	Prox wt % ad: M	A	VM	FC	Ult wt % ad: C	H	O	N	S	SE MJ/kg	CSN	Minor wt % ad: TS	P+S	O	P	F	Cl	As ppm	CO_2	Ash: SiO_2 %	Al_2O_3 %	Trace: B ppm ad	Ga ppm ad
'ccc'	LN 536 1.99	CSIROLR114	100	1.44	3.7	16.8 ab 17.4	30.7 daf 38.6	48.8 61.4	72.3	4.4	6.4 daf 9.1	1.7	0.6	26.98 daf 33.91	1.2	0.58 daf 0.73	0.03	0.55	0.005			1.1	0.12	58.1 15	31.1 1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Hassans Walls and Hartley Main Collieries Coalex Lithgow Valley DDH 1

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
Katoomba seam			1.44	CSIRO LR110
	98.14			
Middle River seam	80		2.94	Coalex
	101.08			
Lithgow seam	40		2.46	CSIRO LR49

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM
CCC	LN1761T1		100	14	47	35	4
WS	2.37			15	44	36	

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM
739		Coalex		75	19	6
				80	20	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
739		Coalex	0.71

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	D	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
WS	LN991 1.44	CSIRO LR110	100	1.47	2.6	15.8 db 16.2	26.1 daf 32.0	55.5 daf 68.0	68.1 83.5	4.0 4.9	7.5 daf 9.2	1.4 1.7	0.6 0.7	27.38 daf 33.56	1	0.56 0.89	0.20 daf 0.25	0.36 0.44	0.055		tr	6	0.05	61.6 1.8	35.2 1.8		
CCC	7696 2710	Coalex			2.3	19.3 db 19.8	31.9 daf 39.5	48.8 daf 60.5						27.92 daf 30.98	4	0.59 daf 0.67												
WS	2.94					3.6								30.17	62	0.69												
140F	7695 2710	Coalex			1.8	15.6 db 16.1	36.1 daf 43.1	50.4 daf 60.9						daf 34.09		daf 0.71												
WS	2.94																										
CCC	LN1767	CSIRO LR49	100	1.40	2.7	15.4 db 15.8	32.1 daf 39.2	49.8 daf 60.8	67.8 82.8	4.7 5.7	7.2 daf 8.8	1.4 1.7	0.7 0.9	27.82 daf 33.97	1	0.68 0.83	0.03 daf 0.04	0.65 0.79	0.016		tr	1	0.05	55.8 1.3	41.9 1.3		
WS	2.37																										

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: West
State Coal Mine, Dobbs Drift

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra Coal Measures				
'Dirty' seam	59.17		3.30	CSIRO LR118
	64.92			
Lithgow seam	160.55		2.54	
	163.09			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	D	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
IS	LN1914 3.02	CSIRO LR118	100	1.54	2.3	28.7 db 29.4	27.4 daf 39.7	41.6 daf 60.3	56.9 82.4	4.0 5.8	6.2 daf 9.0	1.4 2.1	0.5 0.7	23.28 daf 33.70	1	0.51 0.74	0.03 daf 0.04	0.48 0.70	0.022		0.01	6	0.34	75.1 3.0	17.9 1.1		
	64.92																										
	75.78																										
	76.00																										
	88.66																										
	89.81																										
	118.36																										
	118.72																										
	126.58																										
	126.80																										
	128.07																										
	133.30																										
	156.92																										
	186.78																										
	160.55																										
Lithgow seam	163.09		2.54	CSIRO LR118	IS	LN1916 2.45	CSIRO LR118	100	1.40	2.0	14.1 db 14.4	32.8 daf 39.1	51.1 daf 60.9	70.4 83.9	5.0 6.0	6.5 daf 7.4	1.6 1.9	0.6 0.8	29.89 daf 34.26		0.65 0.77	0.02 daf 0.02	0.63 0.75	0.16		0.51	6	0.14	60.8 2.1	29.0 1.3		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: West
Clandulla Colliery

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth – Vit % mmf	Section	Thickness	Source
Illawarra C.M.				
Lithgow seam	60.00		2.12	CSIRO LR108
	62.12			

MICROLITHOTYPE - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+C	Vi+CD+DC	I	SC+MM

MACERAL - VOL %

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	V+E	I	MM

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number – Thickness analysed	Source	Recovery of wt %	RD	PROXIMATE wt % ad M	A	VM	FC	ULTIMATE wt % ad C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % ad S TS	P+S	D	P	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC	LN1729 1.94	CSIRO LR108	100	1.42	2.3	14.5 db 14.8	33.3 daf 40.0	49.9 daf 60.0	68.9 82.9	4.6 5.6	7.4 daf 8.8	1.7 2.1	0.6 0.7	28.05 daf 33.70	1	0.60 0.72	0.07 daf 0.08	0.53 0.64	0.018	1	0.01	2	0.07	49.6 3.0	22.8 1.1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Wancol Lithgow DDH 24

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth m/m % mm/l	Section	Thickness	Source
Illawarra Coal Measures	225.28			
Katoomba seam	55		2.23	Coalex
	227.51			
	238.91			
Middle River seam	82		2.43	
	241.34			
	304.27		1.50	
Walgan seam	71		1.50	
	309.50			
	336.54			
Lithgow seam			2.46	
	339.00			

MICROLITHOTYPE - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	V+C	V+CD+DC	I	SC+MM
CCC'	PN9416 9420 2.23	CSIRO IR532R		35	30	26	9
				8	mmf 33	29	

MACERAL - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	V+E	I	MM
145F	698	Coalex		76	17	7
				mmf 82	18	
150F	699	Coalex		68	28	4
				mmf 71	29	

REFLECTANCE

Sample type	Sample Number	Source	R_o max
CCC'	PN9416 9420	CSIRO IR532R	0.73
145F	698	Coalex	0.81
150F	699	Coalex	0.83

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery	PROXIMATE Air % dd M	A	V	FC	ULTIMATE Air % dd C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % dd TS	P	S	U	B	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	5717 3732 2.23	WS	92	2.3	21.5	25.2	53.3						26.80	1	0.44						0.01						
					db	daf	daf						daf		daf												
140F	5717 3732 2.23	WS	47	2.4	22.0	32.1	47.9						34.14		0.50												
				29	10.7	30.4	58.9						30.17	24	0.58				0.009								
					db	daf							daf		daf												
					11.0	34.0	66.0						34.46		0.65												
CCC'	8582 8593 2.43	WS	91	2.1	27.2	32.6	45.9						25.05	23	0.63												
					db	daf							daf		daf												
145F	8582 8593 2.43	WS	22	2.3	27.8	37.0	63.0						34.41		0.87												
				22	15.1	32.2	52.9						29.38	6	0.78				0.009								
					db	daf							daf		daf												
					15.4	37.4	62.1						34.61		0.90												
CCC'	8546 8600 1.23	WS	89	2.4	24.8	34.6	54.0						32.06	7	0.66												
					db	daf							daf		daf												
150F	8546 8600 1.23	WS	80	2.4	8.4	37.7	62.9						34.20		0.88												
				24.9	9.9	32.9	58.2						32.10		0.86				0.051								
					db	daf							daf		daf												
					9.1	36.1	63.9						35.24		0.90												
CCC'	5702 3714 2.46	13'	89	2.2	17.8	25.2	57.0						28.66	1	0.54						0.01						
					db	daf							daf		daf												
140F	5702 3714 2.46	13'		1.8	2.3	30.7	69.3						34.87		0.60												
				25	10.6	28.3	61.1						31.28	14	0.83				0.018								
					db	daf							daf		daf												
					10.9	31.7	68.3						34.99		0.90												

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN OAKLANDS BASIN
CORRABIN COAL MEASURES
LOCATION: Oaklands
Oaklands Bore DDH 15

PETROGRAPHIC ANALYSES

MACROSCOPIC

STRATIGRAPHY	Depth m/m % mm/l	Section	Thickness	Source
Lanes Shaft seam	86.50			CSIRO IR1036R
	101.64			

MICROLITHOTYPE - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	V+C	V+CD+DC	I	SC+MM
CCC'	LN52868	CSIRO IR1036R		4	22	69	5
ES	16.95			4	23	73	
PC	LN52869			4	21	67	8
ES	16.24			4	mmf 23	73	

MACERAL - VOL %

Sample type	Sample number / Thickness analysed	Source	Recovery of wt %	V+E	I	MM
CCC'	LN52868	CSIRO IR1036R		23	74	3
ES	15.55			mmf 24	76	

REFLECTANCE

Sample type	Sample Number	Source	R_o max

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery	PROXIMATE Air % dd M	A	V	FC	ULTIMATE Air % dd C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % dd TS	P	S	U	B	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	LN52868	CSIRO IR1036R	152	10.6	10.7	26.2	52.6	60.8	3.2	13.2	1.2	0.3	23.26	4	0.36	0.10	0.26	0.001			0.041		0.08	51.3	37.2	20	3
					db	daf				daf			daf		daf												
ES	15.55				12.0	33.3	66.7	77.4	4.1	16.7	1.5	0.3	29.58		0.46	0.15	0.33										
PC	LN52869		154	10.3	13.3	25.9	50.6						22.46		0.36			0.002						55.7	36.8	20	3
					db	daf							daf		daf												
ES	16.24				14.8	33.8	66.2						29.39		0.47									15	1		

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN SYDNEY BASIN
ILLAWARRA COAL MEASURES
LOCATION: Wancol Lithgow DDH 24

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery	PROXIMATE Air % dd M	A	V	FC	ULTIMATE Air % dd C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % dd TS	P	S	U	B	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	5717 3732 2.23	WS	92	2.3	21.5	25.2	53.3						26.80	1	0.44						0.01						
					db	daf	daf						daf		daf												
140F	5717 3732 2.23	WS	47	2.4	22.0	32.1	47.9						34.14		0.50												
				29	10.7	30.4	58.9						30.17	24	0.58				0.009								
					db	daf							daf		daf												
					11.0	34.0	66.0						34.46		0.65												
CCC'	8582 8593 2.43	WS	91	2.1	27.2	26.9	45.9						25.05	23	0.63												
					db	daf							daf		daf												
145F	8582 8593 2.43	WS	22	2.3	27.8	32.0	63.0						34.41		0.87												
				22	15.1	32.2	52.9						29.38	6	0.78				0.009								
					db	daf							daf		daf												
					15.4	37.4	62.1						34.61		0.90												
CCC'	8546 8600 1.23	WS	89	2.4	24.8	34.6	54.0						32.06	7	0.66												
					db	daf							daf		daf												
150F	8546 8600 1.23	WS	80	2.4	8.4	37.7	62.9						34.20		0.88												
				24.9	9.9	32.9	58.2						32.10		0.86				0.051								
					db	daf							daf		daf												
					9.1	36.1	63.9						35.24		0.90												
CCC'	5702 3714 2.46	13'	89	2.2	17.8	25.2	57.0						28.66	1	0.54						0.01						
					db	daf							daf		daf												
140F	5702 3714 2.46	13'		1.8	2.3	30.7	69.3						34.87		0.60												
				25	10.6	28.3	61.1						31.28	14	0.83				0.018								
					db	daf							daf		daf												
					10.9	31.7	68.3						34.99		0.90												

PERMIAN COALS OF EASTERN AUSTRALIA
LATE PERMIAN OAKLANDS BASIN
CORRABIN COAL MEASURES
LOCATION: Oaklands
Oaklands Bore DDH 15

CHEMICAL ANALYSES

Sample type	Sample number / Thickness analysed	Source	Recovery	PROXIMATE Air % dd M	A	V	FC	ULTIMATE Air % dd C	H	O	N	S	SE MJ/kg	CSN	MINOR wt % dd TS	P	S	U	B	F	Cl	As ppm	CO_2	ASH SiO_2 %	Al_2O_3 %	TRACE B ppm ad	Ga ppm ad
CCC'	LN52868	CSIRO IR1036R	152	10.6	10.7	26.2	52.6	60.8	3.2	13.2	1.2	0.3	23.26	4	0.36	0.10	0.26	0.001			0.041		0.08	51.3	37.2	20	3
					db	daf				daf			daf		daf												
ES	15.55				12.0	33.3	66.7	77.4	4.1	16.7	1.5	0.3	29.58		0.46	0.15	0.33										
PC	LN52869		154	10.3	13.3	25.9	50.6						22.46		0.36			0.002						55.7	36.8	20	3
					db	daf							daf		daf												
ES	16.24				14.8	33.8	66.2						29.39		0.47									15	1		

GALILEE BASIN

COOPER BASIN

BOWEN BASIN (EXPOSED SECTION)

SUB-SURAT BASIN SECTION OF THE BOWEN BASIN

GUNNEDAH BASIN

SYDNEY BASIN

OAKLANDS BASIN

OLIVE RIVER BASIN

LAURA BASIN

TASMANIA BASIN

UNDIFFERENTIATED OUTCROP OF PERMIAN AND TRIASSIC SEDIMENTS, JURASSIC DOLERITE AND TERTIARY BASALT

LEGEND

- T — Tertiary Sediments
- T? — Tertiary Volcanics
- J-K — Jurassic - Cretaceous
- R — Triassic
- P — Permian
- pP — Pre - Permian

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 1

GENERALISED SURFACE GEOLOGY

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PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 2

STRUCTURAL SUBDIVISIONS OF THE PERMIAN COAL BASINS

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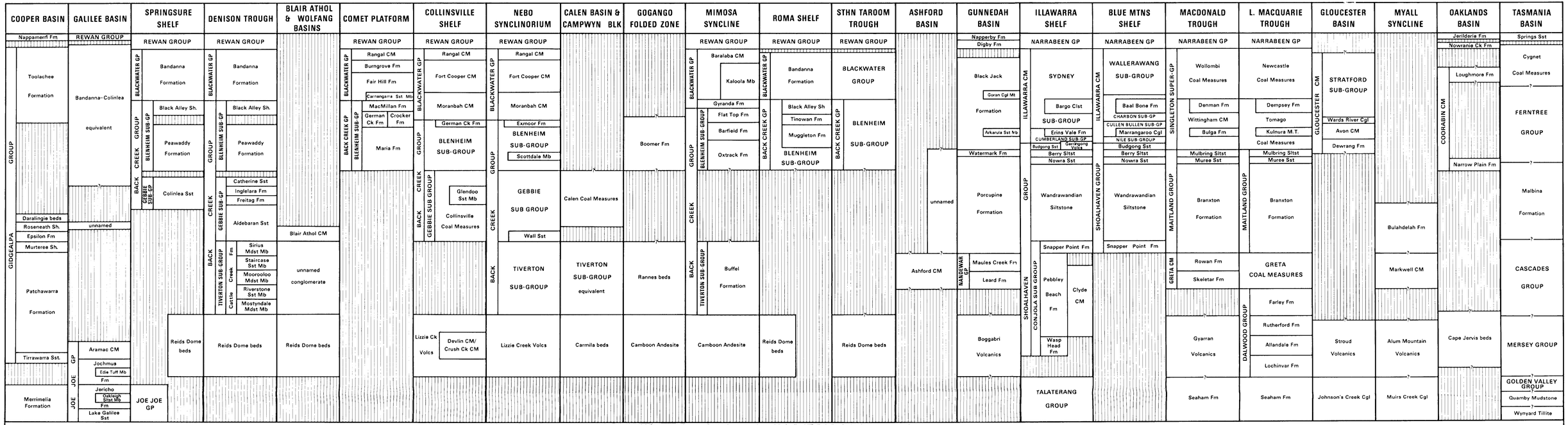
LOLWORTH - RAVENSWOOD BLOCK
MOUNT ISA
LOVELLE DEPRESSION
WETHERBY STRUCTURE
CORK ELDERSLIE RIDGE FAULT
MANEROO PLATFORM
BERYL RIDGE
KOBURRA TROUGH
HULTON-RAND STRUCTURE
BARCALDINE RIDGE
TARA STRUCTURE
ANAKIE
COLLINSVILLE SHELF
EUNGELLA - COLLINSVILLE CONNORS ARCH
NEBO SYNCLINORIUM
TAROOM - CRACOW ARCH
DRUMMOND BASIN
BLAIR ATHOL and WOLFANG BASINS
KARIN BASIN
COMET HIGH
COMET PLATFORM
DENISON TROUGH
DAWSON-DURANGA FOLDED ZONE
GOGANGO HIGH
MOBILE BELT
AUBURN ZONE
MIMOSA SYNCLINE
BONNIE DOON RIDGE
SPRINGSURE SHELF
POWELL DEPRESSION
CANAWAY RIDGE
PLEASANT CREEK ARCH
THOMSON SYNCLINE
Trend
Chandos
Mt Howitt
COOPER SYNCLINE
YAMMA YAMMA DEPRESSION
ARRABURY TROUGH
PATCHAWARRA TROUGH
NAPPAMERRY TROUGH
TENNAPERA TROUGH
Karmona
Durham Downs
Jackson
Gidgealpa-Merrimelia-Innamincka
Murteree-Nappacoongee
Tickalara
Wolgolla
Toolachee
THARGOMINDA SHELF
NOBINE RIDGE
ROMA SHELF
ARBROATH TROUGH
BONNIE DOON RIDGE
TROUGH
ST GEORGE/BOLLON SLOPE
MULGALDIE RIFT
CHINCHILLA - GOONDIWINDI SLOPE
BRAMWELL ARCH
WEIPA
OLIVE RIVER BASIN
DEPRESSION
CARPENTARIA BASIN
COEN INLIER (PENINSULA RIDGE)
LAURA BASIN
KIMBA ARCH
YAMBO INLIER
HODGKINSON BASIN
MT MULLIGAN
GREAT BARRIER REEF
Torres Strait
Princess Charlotte Bay
Cape Melville
Flinders Reefs
Raine Island Entrance
Wreck Bay
Cairns
Cooktown
Tully
Townsville
Ingham
Ayr
Bowen
Proserpine
Mackay
Rockhampton
Gladstone
Biloela
Moura
Theodore
Taroom
Injune
Roma
Mitchell
Charleville
Quilpie
Thargomindah
Cunnamulla
Surat
St George
Dalby
Miles
Chinchilla
Kingaroy
Gympie
Maryborough
Bundaberg
Monto
Mundubbera
Toowoomba
Millmerran
Brisbane
Gold Coast
Murwillumbah
Lismore
Ballina
Stanthorpe
Tenterfield
Ashford
ASHFORD BASIN
Inverell
Glen Innes
Grafton
Coffs Harbour
Armidale
Tamworth
Walcha
Kempsey
Port Macquarie
Taree
Gloucester
GLOUCESTER BASIN
MYALL SYNCLINE
HUNTER THRUST
HUNTER TROUGH
SINGLETON RIDGE
MACDONALD TROUGH
KULNURA RIDGE
MACQUARIE TROUGH
NORTHUMBERLAND RIDGE
NEWCASTLE
Maitland
Singleton
Muswellbrook
Scone
Gunnedah
Narrabri
Boggabri
Coonamble
Coonabarabran
Walgett
Moree
Bourke
Wilcannia
Cobar
Nyngan
Dubbo
Wellington
Mudgee
Orange
Bathurst
Lithgow
BLUE MOUNTAINS SHELF
Mt Coricudgy Anticline
Parkes
Forbes
Condobolin
Hillston
West Wyalong
Cowra
Katoomba
LACHLAN FOLDBELT
CUMBERLAND BASIN
WORONORA RIDGE
WOLLONGONG
ILLAWARRA SHELF
Goulburn
Nowra
Kiama
Wollongong
Batemans Bay
Ulladulla
Cooma
Bega
Young
Griffith
Hay
Balranald
Mildura
Renmark
Swan Hill
Deniliquin
Oaklands
OAKLANDS BASIN
Narrandera
Cootamundra
Junee
Yass
Wagga Wagga
Tumut
CANBERRA
Albury
Corowa
Echuca
Bordertown
Horesham
BENDIGO
Seymour
Mansfield
BALLARAT
Hamilton
MELBOURNE
GEELONG
Portland
Warrnambool
Wonthaggi
Moe
Sale
Orbost
Lakes Entrance
Cape Howe
WILSONS PROMONTORY
Tibooburra
Broken Hill
Olary
Leigh Creek
Port Augusta
Whyalla
Port Pirie
Peterborough
Burra
Ivanhoe
Barcaldine
Longreach
Winton
Richmond
Hughenden
Julia Creek
Cloncurry
Ducheas
Georgetown
Charters Towers
Collinsville
Proserpine
Weipa
Coen
Aurukun
Weipa
Normanton
Karumba
Burketown
Bedourie
Birdsville
Windorah
Blackall
Jericho
Alpha
Emerald
Springsure
Rolleston
Capella
Clermont
Dysart
Collinsville
Sarina
Nebo
St Lawrence
Aramac
Barcaldine
Tibooburra
Tiboobura
Quilpie
Thargomindah
Cunnamulla
Mitchell
Roma
Injune
Taroom
Theodore
Moura
Biloela
Gladstone
Rockhampton
Yeppoon
Mackay
Proserpine
Collinsville
Townsville
Ingham
Ayr
Bowen
Charters Towers
Georgetown
Normanton
Karumba
Burketown
Mount Isa
Cloncurry
Julia Creek
Richmond
Hughenden
Winton
Longreach
Barcaldine
Aramac
Jericho
Alpha
Emerald
Springsure
Rolleston
Blackall
Tambo
Augathella
Charleville



PERMIAN COALS OF EASTERN AUSTRALIA

STRATIGRAPHIC CORRELATION CHART OF THE PERMIAN COAL BASINS Plate 3

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PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 4

STRUCTURE CONTOURS BASE OF REIDS DOME BEDS, ARAMAC COAL MEASURES AND PATCHAWARRA FORMATION

LEGEND

- CONTOUR, STANDARD INTERVAL (200m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

SCALE 0 50 100 150 km

1 : 2 500 000

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CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

15/A/103

* IDENTIFICATION OF ARAMAC C.M. IN CORFIELD Nº1 IS UNCERTAIN

PATCHAWARRA FORMATION – STAGE 3 TO UPPER STAGE 4

LEGEND

CONTOUR, STANDARD INTERVAL (200m)

CONTOUR, NON STANDARD INTERVAL

CONTOUR INFERRED

CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED

CONTOURED UNIT LOCALLY ABSENT

CONTROL POINT

FAULT

FAULT INFERRED

G.L. GROUND LEVEL

SCALE

0 50 100 150 km

1: 2 500 000

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 5

STRUCTURE CONTOURS TOP OF REIDS DOME BEDS, ARAMAC COAL MEASURES AND PATCHAWARRA FORMATION

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PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 6

STRUCTURE CONTOURS BASE OF GRETA COAL MEASURES AND OTHER MIDDLE COAL MEASURES

(CLYDE C.M., COLLINSVILLE C.M., BLAIR ATHOL C.M., ALDEBARAN SST., COLINLEA SST., & EPSILON FM.)

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CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

LEGEND

- CONTOUR, STANDARD INTERVAL (200m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

SCALE

0 50 100 150 km

1 : 2 500 000

ALDEBARAN SST MOSTLY MARINE

GREAT BARRIER REEF

MOUNT ISA · Cloncurry · Julia Creek · Richmond · Hughenden · Winton · Longreach · Barcaldine · Charters Towers · Townsville · Ingham · Bowen · Collinsville · Proserpine · MACKAY · Clermont · ROCKHAMPTON · Gladstone · Biloela · Moura · BUNDABERG · Maryborough · Gympie · Dalby · TOOWOOMBA · BRISBANE · GOLD COAST · Murwillumbah · Ballina · Lismore · Grafton · Inverell · Glen Innes · Armidale · Coffs Harbour · Tamworth · Walcha · Kempsey · Port Macquarie · NEWCASTLE · GOSFORD · SYDNEY · WOLLONGONG · Kiama · Ulladulla · Batemans Bay · Cooma · CANBERRA · Goulburn · Nowra · Wagga Wagga · Albury · Young · Griffith · Cootamundra · Forbes · Orange · Bathurst · Lithgow · Dubbo · Parkes · Cowra · Mudgee · Gunnedah · Narrabri · Moree · Inverell · Walgett · Bourke · Cobar · Nyngan · Coonamble · Gilgandra · Coonabarabran · Quirindi · Scone · Muswellbrook · Singleton · Cessnock · Gloucester · Taree · Forster · Wellington · Condobolin · Hillston · West Wyalong · Ivanhoe · Charleville · Mitchell · Quilpie · Augathella · Blackall · Barcaldine · Alpha · Jericho · Emerald · Clermont · Blair Athol · Collinsville · Proserpine · Mackay · Yeppoon · Rockhampton · Gladstone · Biloela · Moura · Taroom · Mundubbera · Monto · Gayndah · Kingaroy · Nanango · Miles · Chinchilla · Roma · Surat · Warwick · Stanthorpe · Tenterfield · Ashford · Goondiwindi · Mungindi · St George · Thargomindah · Cunnamulla · Tibooburra · Bourke · Walgett · Coonamble · Gilgandra · Dubbo · Wellington · Mudgee · Kandos · Lithgow · Katoomba · Bathurst · Orange · Forbes · Cowra · Young · Griffith · Hay · Balranald · Mildura · Renmark · Swan Hill · Deniliquin · Jerilderie · Tocumwal · Corowa · Albury · Wangaratta · Benalla · Bright · Echuca · Bordertown · Horsham · BENDIGO · Seymour · Mansfield · BALLARAT · Hamilton · MELBOURNE · GEELONG · Portland · Warrnambool · Wonthaggi · Moe · Sale · Lakes Entrance · Orbost · Cape Howe · WILSONS PROMONTORY · Mount Isa · Duchess · Boulia · Birdsville · Bedourie · Windorah · Quilpie · Thargomindah · Tibooburra · Leigh Creek · Port Augusta · WHYALLA · Port Pirie · Peterborough · Burra · Broken Hill · Ivanhoe · Hillston · West Wyalong · Griffith · Hay · Balranald · Mildura · Renmark · Swan Hill · Deniliquin · Jerilderie · Tocumwal · Corowa · Albury · Wangaratta · Benalla · Bright · Echuca · Bordertown · Horsham · BENDIGO · Seymour · Mansfield · BALLARAT · Hamilton · MELBOURNE · GEELONG · Portland · Warrnambool · Wonthaggi · Moe · Sale · Lakes Entrance · Orbost · Cape Howe · WILSONS PROMONTORY · Cooma · Batemans Bay · Ulladulla · Nowra · Kiama · Wollongong · Goulburn · Yass · Junee · Narrandera · Coleambally · Cootamundra · Wagga Wagga · Albury · Corowa · Tocumwal · Jerilderie · Deniliquin · Oaklands · Berrigan · Swan Hill · Echuca · Bordertown · Horsham · BENDIGO · Seymour · Mansfield · BALLARAT · Hamilton · MELBOURNE · GEELONG · Portland · Warrnambool · Wonthaggi · Moe · Sale · Lakes Entrance · Orbost · Cape Howe · WILSONS PROMONTORY · Cooma · Batemans Bay · Ulladulla · Nowra · Kiama · Wollongong · Goulburn · Yass · Junee · Narrandera · Coleambally · Cootamundra · Wagga Wagga · Albury · Corowa · Tocumwal · Jerilderie · Deniliquin · Oaklands · Berrigan · Swan Hill · Echuca · Bordertown · Horsham · BENDIGO · Seymour · Mansfield · BALLARAT · Hamilton · MELBOURNE · GEELONG · Portland · Warrnambool · Wonthaggi · Moe · Sale · Lakes Entrance · Orbost · Cape Howe · WILSONS PROMONTORY

HOBART · LAUNCESTON · Devonport · Wynyard · Burnie · Queenstown · Oatlands

15/A/105

COLLINSVILLE COAL MEASURES NOT PRESENT

ALDEBARAN SST MOSTLY MARINE

ALDEBARAN SST PRESENT

525 G.L.
230 G.L.

460 G.L.

+40 G.L.

LEGEND

- CONTOUR, STANDARD INTERVAL (200m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

G.L. GROUND LEVEL

SCALE
0 50 100 150 km
1: 2 500 000

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 7

STRUCTURE CONTOURS TOP OF GRETA COAL MEASURES AND OTHER MIDDLE COAL MEASURES

(CLYDE C.M., COLLINSVILLE C.M., BLAIR ATHOL C.M., ALDEBARAN SST. COLINLEA SST., & DARALINGIE BEDS.

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PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 8

ISOPACHS OF GRETA COAL MEASURES AND OTHER MIDDLE COAL MEASURES

(CLYDE C.M., COLLINSVILLE C.M., BLAIR ATHOL C.M., ALDEBARAN SST., COLINLEA SST., & DARALINGIE BEDS - ROSENEATH SHALE - EPSILON FM.)

LEGEND

- CONTOUR, STANDARD INTERVAL (60m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

SCALE 0 50 100 150 km

1 : 2 500 000

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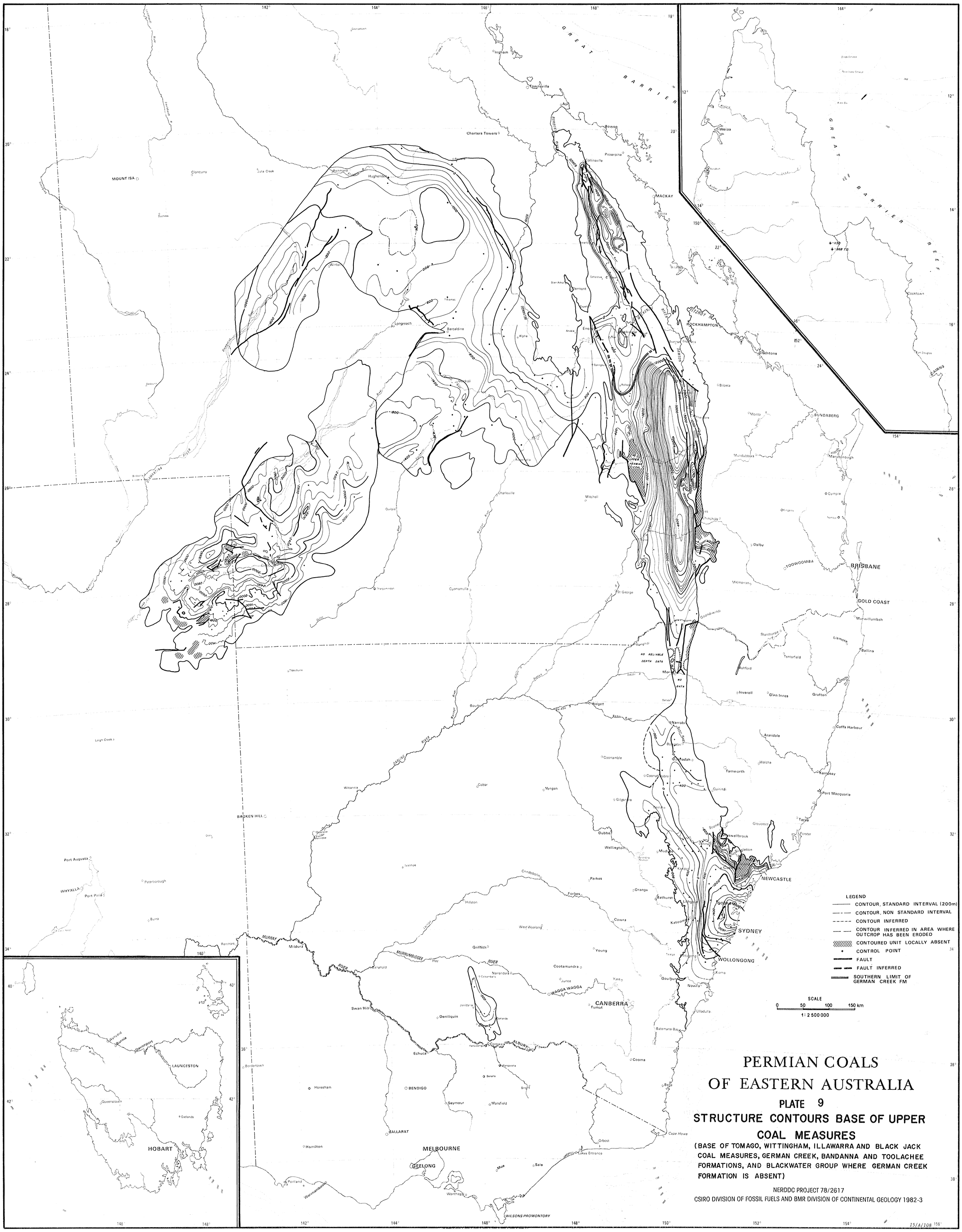
15/A/10


GREAT BARRIER REEF
MOUNT ISA
Cloncurry
Julia Creek
Richmond
Hughenden
Charters Towers
Ingham
Townsville
Ayr
Bowen
Collinsville
Proserpine
MACKAY
Winton
Longreach
Barcaldine
Clermont
ROCKHAMPTON
Gladstone
Biloela
Monto
BUNDABERG
Maryborough
Gympie
Dalby
TOOWOOMBA
BRISBANE
GOLD COAST
Murwillumbah
Ballina
Lismore
Grafton
Inverell
Glen Innes
Tenterfield
Ashford
Coffs Harbour
Armidale
Tamworth
Walcha
Kempsey
Port Macquarie
Taree
Forster
Gloucester
Singleton
Muswellbrook
NEWCASTLE
SYDNEY
WOLLONGONG
Kiama
Nowra
Ulladulla
Batemans Bay
Cooma
CANBERRA
Goulburn
Young
Cootamundra
WAGGA WAGGA
Griffith
Narrandera
Parkes
Forbes
Orange
Bathurst
Lithgow
Katoomba
Dubbo
Wellington
Cowra
Mudgee
Scone
Quirindi
Gunnedah
Narrabri
Walgett
Bourke
Cobar
Nyngan
Coonamble
Gilgandra
Coonabarabran
Mitchell
Charleville
Quilpie
Thargomindah
Cunnamulla
St George
Goondiwindi
Chinchilla
Roma
Miles
Kingaroy
Nanango
Dirranbandi
Mungindi
Tibooburra
Wilcannia
Ivanhoe
Hillston
West Wyalong
Condobolin
Griffith
Narrandera
Coleambally
Junee
Yass
Gunning
Goulburn
Deniliquin
Jerilderie
Oaklands
Swan Hill
Echuca
Kerang
Cohuna
Barham
Wakool
Balranald
Hay
Mildura
Renmark
Broken Hill
Menindee
Packsaddle
Paroo
Cooper
Diamantina
Birdsville
Windorah
Eromanga
Quilpie
Thargomindah
Eulo
Cunnamulla
Tibooburra
Bourke
Walgett
Narrabri
Gunnedah
Coonabarabran
Coonamble
Gilgandra
Dubbo
Wellington
Mudgee
Scone
Muswellbrook
Singleton
Cessnock
Gosford
Wyong
Katoomba
Lithgow
Bathurst
Orange
Parkes
Forbes
Cowra
Young
Cootamundra
Griffith
Narrandera
Junee
Yass
Goulburn
Crookwell
Gunning
Kiama
Nowra
Ulladulla
Batemans Bay
Moruya
Cooma
Bega
Merimbula
Eden
Orbost
Lakes Entrance
Sale
Moe
Traralgon
Warragul
Dandenong
Cape Howe
WILSONS PROMONTORY
Portland
Warrnambool
Hamilton
Casterton
Horsham
Dimboola
Stawell
BALLARAT
BENDIGO
Kyneton
Seymour
Mansfield
Benalla
Wangaratta
Bright
Corowa
Yarrawonga
Cobram
Tocumwal
Finley
Berrigan
Jerilderie
Deniliquin
Oaklands
Swan Hill

AGES OF BASES OF BANDANNA FORMATION (GALILEE BASIN) AND TOOLACHEE FORMATION (COOPER BASIN) ARE UNCERTAIN AND THESE UNITS MAY INCLUDE OLDER SEDIMENTS OF TOMAGO COAL MEASURES AGE

OAKLANDS BASIN
NEWCASTLE COAL MEASURES EQUIVALENT PRESENT WITHIN COORABIN COAL MEASURES BUT ITS BASE HAS NOT YET BEEN RECOGNIZED

GUNNEDAH BASIN
NEWCASTLE COAL MEASURES EQUIVALENT PRESENT, BUT ITS BASE HAS NOT YET BEEN RECOGNIZED IN MOST BORES

LEGEND

- CONTOUR, STANDARD INTERVAL (200m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

SCALE
0 50 100 150 km
1 : 2 500 000

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 10

STRUCTURE CONTOURS BASE OF NEWCASTLE COAL MEASURES EQUIVALENTS

(NEWCASTLE & WOLLOMBI C.M., ANGUS PLACE & DARKES FOREST SSTS, BANDANNA & FAIR HILL FMS, FORT COOPER & BARALABA CM., & TOOLACHEE FM.)

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PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 11

STRUCTURE CONTOURS TOP OF UPPER COAL MEASURES

(TOP OF NEWCASTLE, WOLLOMBI, ILLAWARRA, BLACK JACK, BARALABA AND RANGAL COAL MEASURES, BANDANNA FM AND GIDGEALPA GROUP)

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LEGEND

- CONTOUR, STANDARD INTERVAL (200m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

SCALE
0 50 100 150 km
1: 2 500 000

NO RELIABLE DEPTH DATA

NO DATA

GREAT BARRIER REEF

MOUNT ISA · Cloncurry · Julia Creek · Hughenden · Richmond · Winton · Longreach · Barcaldine · Blackall · Charters Towers · Townsville · Ingham · Bowen · Collinsville · Proserpine · MACKAY · Clermont · Emerald · ROCKHAMPTON · Gladstone · Biloela · BUNDABERG · Maryborough · Gympie · Dalby · TOOWOOMBA · BRISBANE · GOLD COAST · Goondiwindi · Warwick · Stanthorpe · Tenterfield · Lismore · Ballina · Murwillumbah · Inverell · Glen Innes · Grafton · Coffs Harbour · Armidale · Tamworth · Walcha · Kempsey · Port Macquarie · Taree · Gloucester · Forster · Dungog · Scone · Muswellbrook · Singleton · Maitland · Cessnock · NEWCASTLE · GOSFORD · SYDNEY · WOLLONGONG · Kiama · Nowra · Ulladulla · Batemans Bay · Bega · Cooma · CANBERRA · Tumut · Goulburn · Mittagong · Katoomba · Lithgow · Bathurst · Orange · Parkes · Forbes · Condobolin · Cowra · Young · Cootamundra · Junee · Yass · Narrandera · WAGGA WAGGA · Griffith · Hay · Deniliquin · Swan Hill · Mildura · Renmark · Balranald · Ivanhoe · Hillston · West Wyalong · Mitchell · Charleville · Quilpie · Cunnamulla · Thargomindah · St George · Dirranbandi · Mungindi · Moree · Narrabri · Walgett · Bourke · Cobar · Nyngan · Coonamble · Gilgandra · Coolah · Dubbo · Wellington · Mudgee · Merriwa · Scone · Quirindi · Coonabarabran · Gunnedah · Boggabri · Wee Waa · Collarenebri · Walgett · Brewarrina · Bellata · Goondiwindi · Yelarbon · Wallangarra · Tenterfield · Glen Innes · Inverell · Ashford · Warialda · Narrabri · Coonabarabran · Coonamble · Gilgandra · Dubbo · Wellington · Mudgee · Merriwa · Singleton · Muswellbrook · Scone · Gloucester · Taree · Forster · Dungog

AGES OF BASES OF BANDANNA FORMATION (GALILEE BASIN) AND TOOLACHEE FORMATION (COOPER BASIN) ARE UNCERTAIN, AND THESE UNITS MAY INCLUDE OLDER SEDIMENTS OF TOMAGO COAL MEASURES AGE

OAKLANDS BASIN
NEWCASTLE COAL MEASURES EQUIVALENT PRESENT WITHIN COORABIN COAL MEASURES BUT ITS BASE HAS NOT YET BEEN RECOGNIZED

GUNNEDAH BASIN
NEWCASTLE COAL MEASURES EQUIVALENT PRESENT, BUT ITS BASE HAS NOT YET BEEN RECOGNIZED IN MOST BORES

LEGEND
- CONTOUR, STANDARD INTERVAL (60 m)
- CONTOUR, NON STANDARD INTERVAL
- CONTOUR INFERRED
- CONTOUR INFERRED IN AREA WHERE OUTCROP HAS BEEN ERODED
- CONTOURED UNIT LOCALLY ABSENT
- CONTROL POINT
- FAULT
- FAULT INFERRED

SCALE
0 50 100 150 km
1 : 2 500 000

PERMIAN COALS OF EASTERN AUSTRALIA

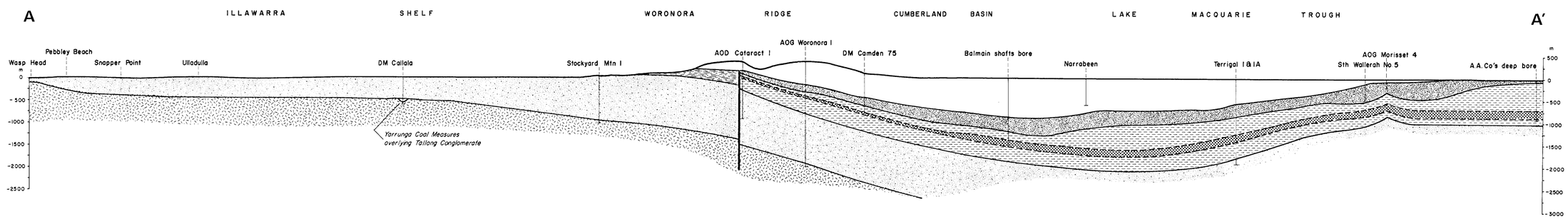
PLATE 12

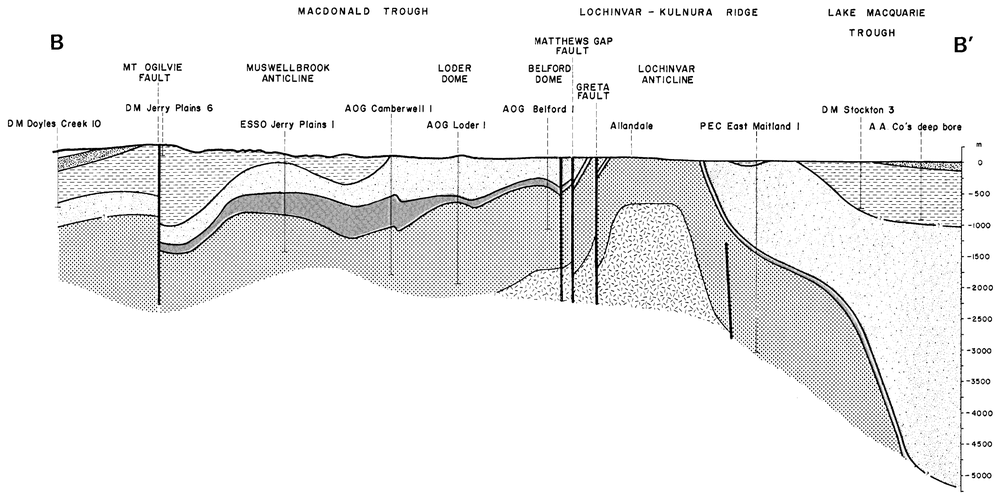
ISOPACHS OF NEWCASTLE COAL MEASURES AND EQUIVALENTS

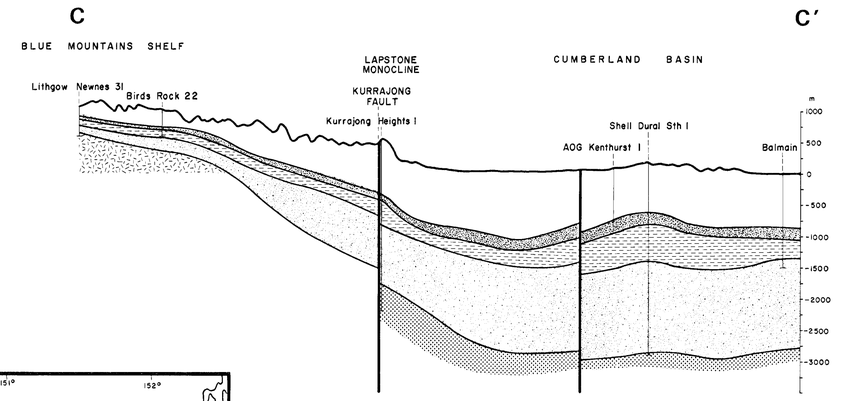
(NEWCASTLE & WOLLOMBI C.M., UPPER ILLAWARRA C.M., BARALABA C.M., FORT COOPER C.M., FAIR HILL FM., BURNGROVE FM., RANGAL C.M., BANDANNA FM., & TOOLACHEE FM.)

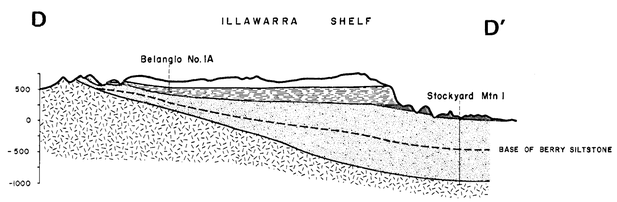
NERDDC PROJECT 78/2617
CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

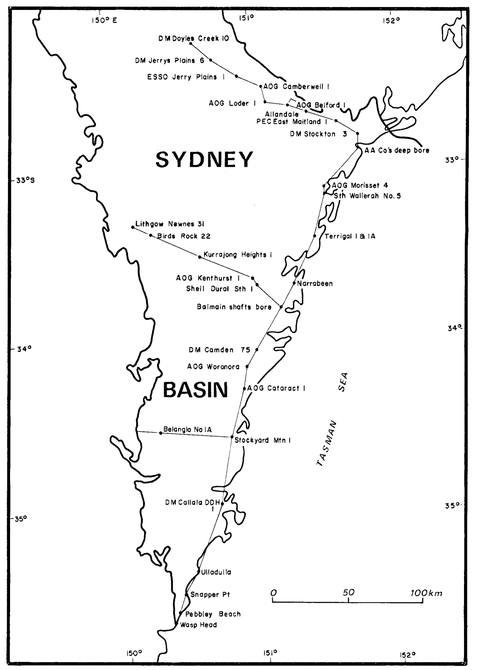
15/A/111











LOCALITY MAP

LEGEND

- Triassic
- Newcastle & Wollombi Coal Measures
- Tomago & Wittingham Coal Measures
- Kulnura Marine Tongue
- Illawarra Coal Measures
- Gerringong Volcanics
- Maitland & Shoalhaven Groups
- Greta Coal Measures
- Dalwood Group
- Basement

$\frac{V}{H} = 10$

0 10 20 30 40 50km

SCALE

Datum : Sea - level
Cainozoic omitted

PERMIAN COALS OF EASTERN AUSTRALIA

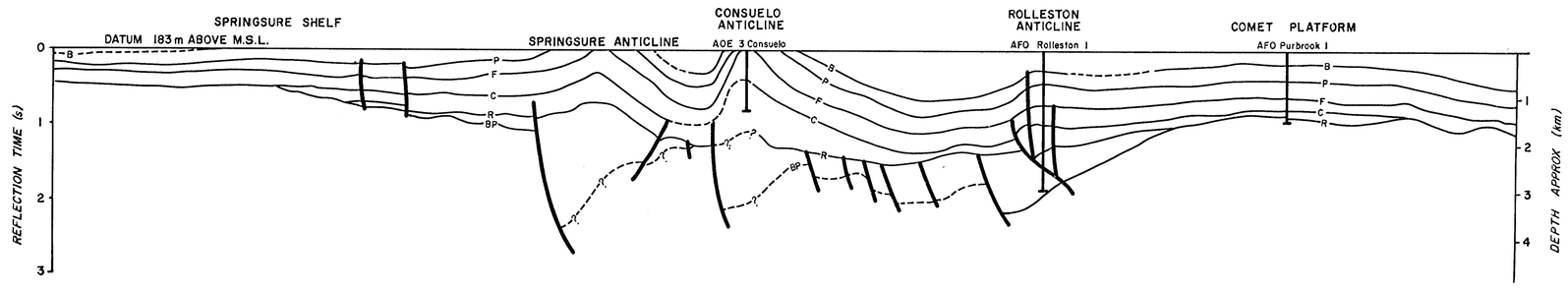
PLATE 13

SYDNEY BASIN CROSS SECTIONS

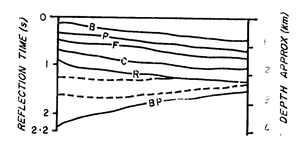
BMR DIVISION OF CONTINENTAL GEOLOGY AND CSIRO DIVISION OF FOSSIL FUELS 1982-3 NERDDC PROJECT 78/2617

15/4/112

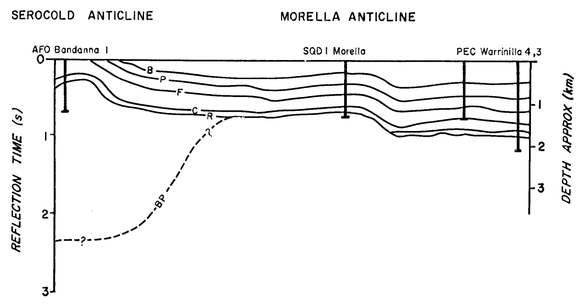
TRAVERSE 4



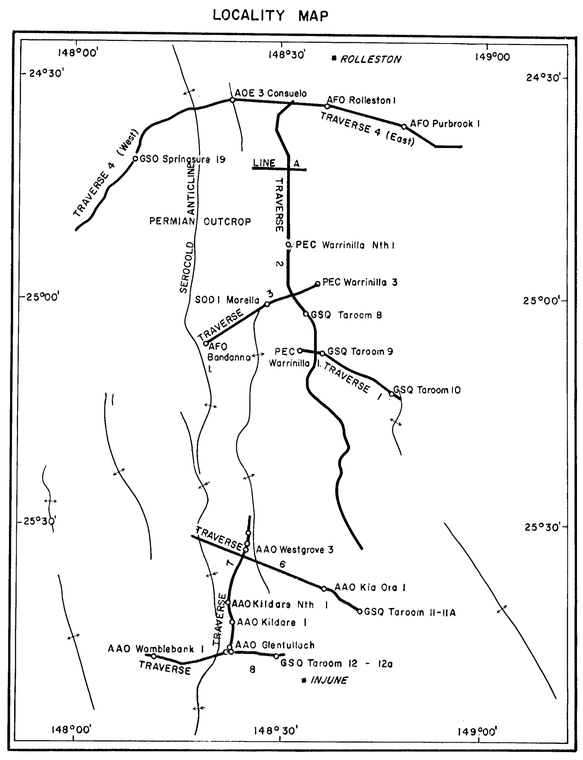
LINE A



TRAVERSE 3

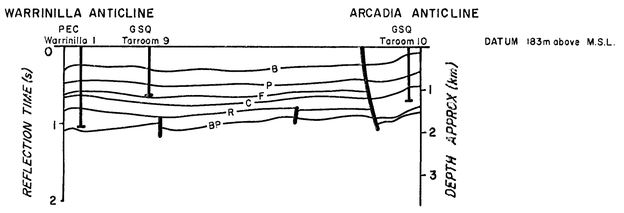


LOCALITY MAP

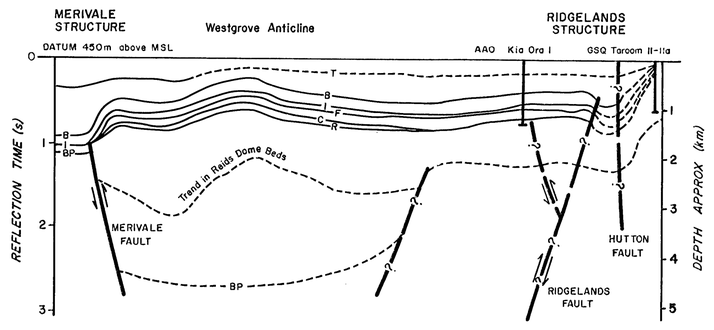


See locality map of plate 15; see also plates 30 and 33

TRAVERSE 1



TRAVERSE 6



LEGEND

B	Top of Bandanna Formation
P	" " Peawaddy Formation
I	" " Ingelara Formation
F	" " Freitag Formation
C	" " Cattle Creek Formation
R	" " Reids Dome Beds
T	Triassic/Jurassic unconformity
BP	Base of Permian sequence

SCALE

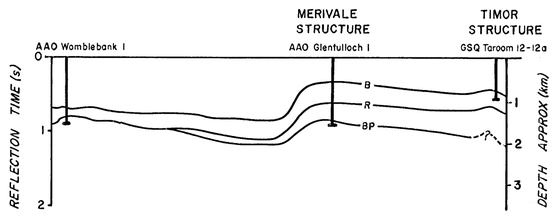
1 : 250 000

0 10 20 km

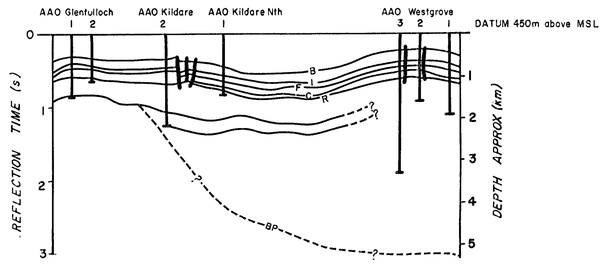
$\frac{V}{H} = 3$

After Bauer and Dixon, 1981, BMR J. Aust. Geol. & Geoph., 6, 213-222 and Nelson and Bauer, 1981, Qld. Govt. Min. J., 82(958), 366-375.

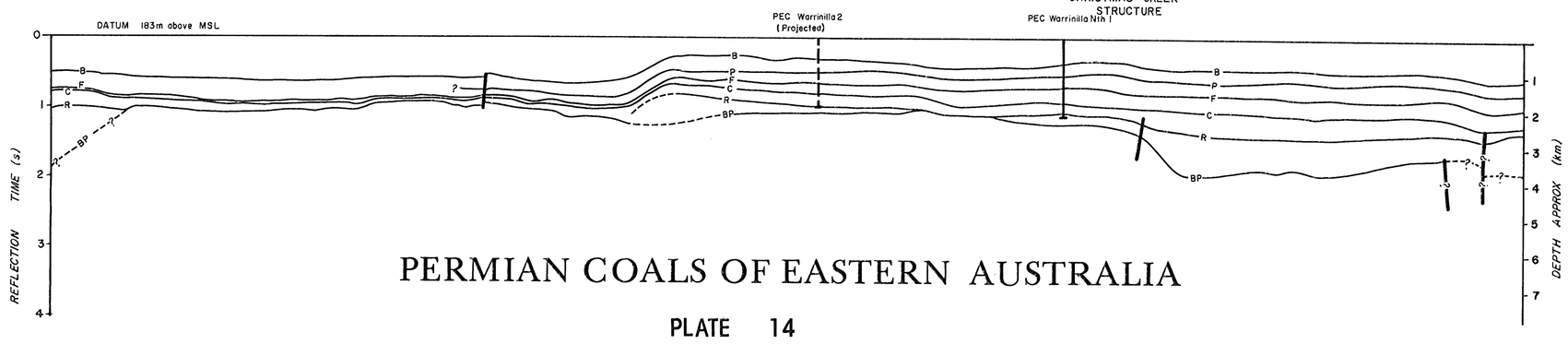
TRAVERSE 8



TRAVERSE 7



TRAVERSE 2

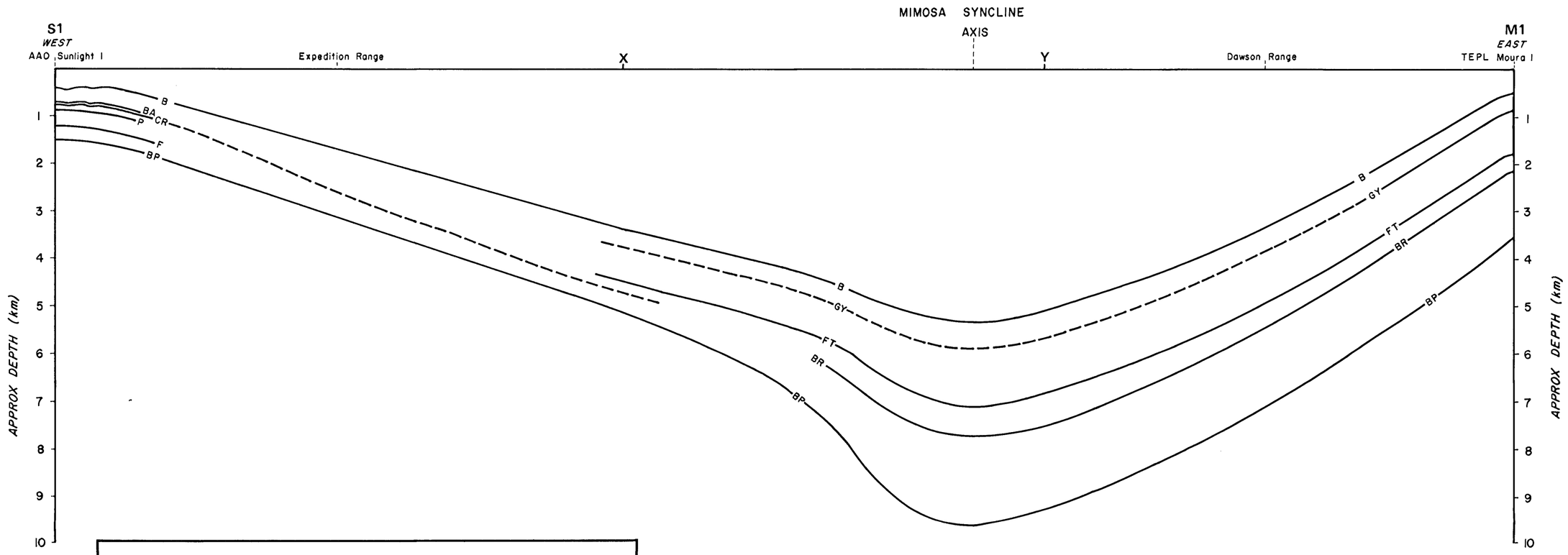


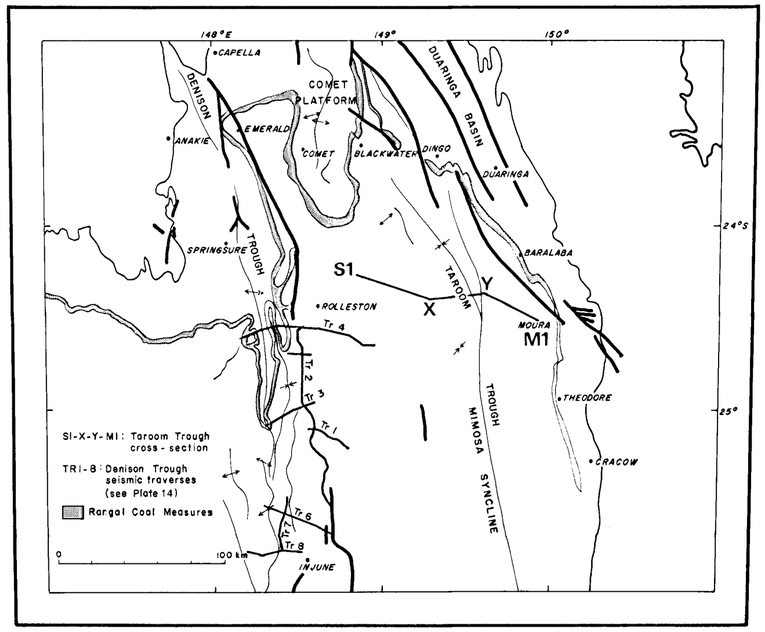
PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 14

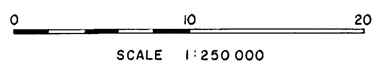
DENISON TROUGH CROSS-SECTIONS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3





LOCALITY MAP



$\frac{V}{H} = 3$

LEGEND

B	Top of Baralaba and Bandanna Formation
BA	Top of Black Alley Shale
CR	Top of Crocker Formation
P	Top of Peawaddy Formation
F	Top of Freitag Formation
GY	Top of Gyranda Formation
FT	Top of Flat Top Formation
BR	Top of Barfield Formation
BP	Base of Permian sediments (Top of Volcanics)

TAROOM TROUGH CROSS SECTION

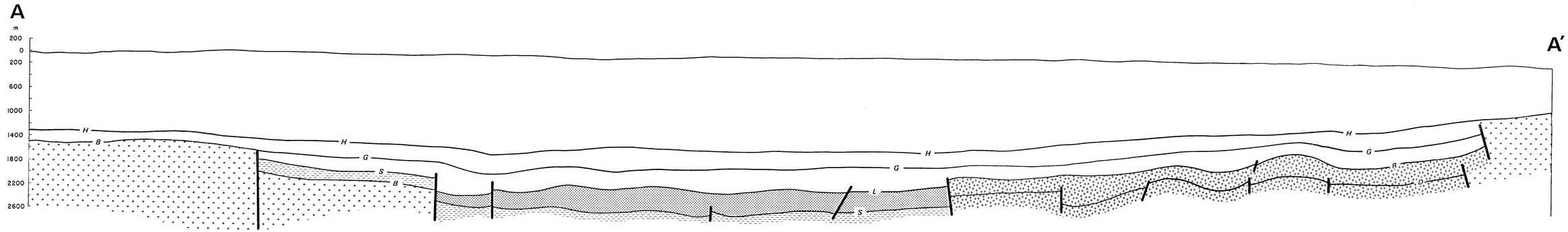
Based on seismic data displayed by C. Herbert at the Permian Geology of Queensland Conference, July 1982, and, near A.A.O. Sunlight 1 well, on the seismic map of the Sunlight Structure given by Mines Administration (1966). Correlation of the Black Alley Shale-Crocker Formation boundary (CR) with the Flat Top Formation is according to the palynological work of Foster (1981). Numerous faults of relatively small displacements (not shown) occur in the section. Except for the central portion X-Y, the cross-section does not follow seismic traverses directly. Depths are estimates only.

PERMIAN COALS OF EASTERN AUSTRALIA

NERDDC PROJECT 78/2617
CSIRO AND BMR 1982-3

PLATE 15

15/A/114



PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 16

SOUTHERN SURAT BASIN CROSS-SECTION

NERDDC PROJECT 78/2617

BMR DIVISION OF CONTINENTAL GEOLOGY AND CSIRO DIVISION OF FOSSIL FUELS 1982-3

LEGEND

- *H* Top of Hutton Sandstone
- *G* Precipice Sandstone
- *L* Top of Blackwater Group
- *S* Reflector in Back Creek Group
- *R* Top of Reids Dome Beds
- *B* Top of Basement
- *D* Reflector in Reids Dome Beds
- Blackwater Group
- Back Creek Group
- Reids Dome Beds
- Basement
- Fault

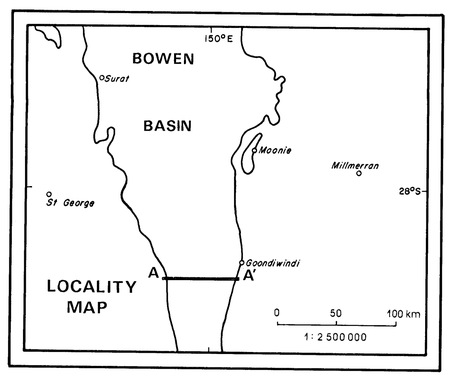
Scale

0 2 4 6 8 km

$\frac{V}{H} = 3$

Datum : 183 m a.s.l.
(approx. surface level)

From KAHANOFF (1963)



15/A/115

136°30'E 138°00' 139°30' 141°00' 142°30' 144°00' 145°30' 147°00' 148°30' 150°00'

20°00'S 22°00' 24°00' 26°00' 28°00' 30°00'

GEORGETOWN INLIER

LOLWORTH - RAVENSWOOD BLOCK

SOUTH PACIFIC OCEAN

EUROKA ARCH

MT ISA INLIER

GEORGINA BASIN

GALILEE BASIN

WETHERBY STRUCTURE

FAULT

CORK

BELYANDO FEATURE

DRUMMOND BASIN

ANAKIE INLIER

BOWEN BASIN

ARUNTA BLOCK

WINTON - MACHATTIE MAGNETIC LINEAMENT

DIAMANTINA GRAVITY GRADIENT

HIGH

ADAVALE BASIN

FAULT

CANAWAY

WARREGO TROUGH

WARBURTON BASIN

KOPPERAMANNA - WARBRECCAN

COOPER BASIN

RIDGE

NEBINE RIDGE

PEDIRKA BASIN

HIGH

KOPPERAMANNA - NARYILCO

LAKE BLANCHE FAULT

EULO RIDGE

MULOORINA RIDGE

MT PAINTER BLK

ADELAIDE FOLD BELT

ARROWIE BASIN

WILLYAMA BLOCK

BANCANNIA TROUGH

WONOMINTA BLOCK

DARLING BASIN

LACHLAN FOLD BELT

LEGEND

- Jurassic - Cretaceous basin boundary
- Late Carboniferous - Permian - Triassic basin boundary
- Devonian - Carboniferous basin boundary
- Cambrian - Ordovician basin boundary
- Exposed tectonic province boundary
- Granite boundary
- Gabbro
  (geophysical interpretation)
- Fault
- Lineament, gradient
- Fold Axis
- Basement high

BASEMENT

- Pre - Permian
- Late Palaeozoic
- Devonian - Carboniferous
- Silurian - Devonian
- Cambrian - Ordovician
- Innamincka Red beds
- Proterozoic
- Granite
- Volcanics
- Gneiss

SCALE

0 50 100 150 km

1 : 2 500 000

PERMIAN COALS OF EASTERN AUSTRALIA

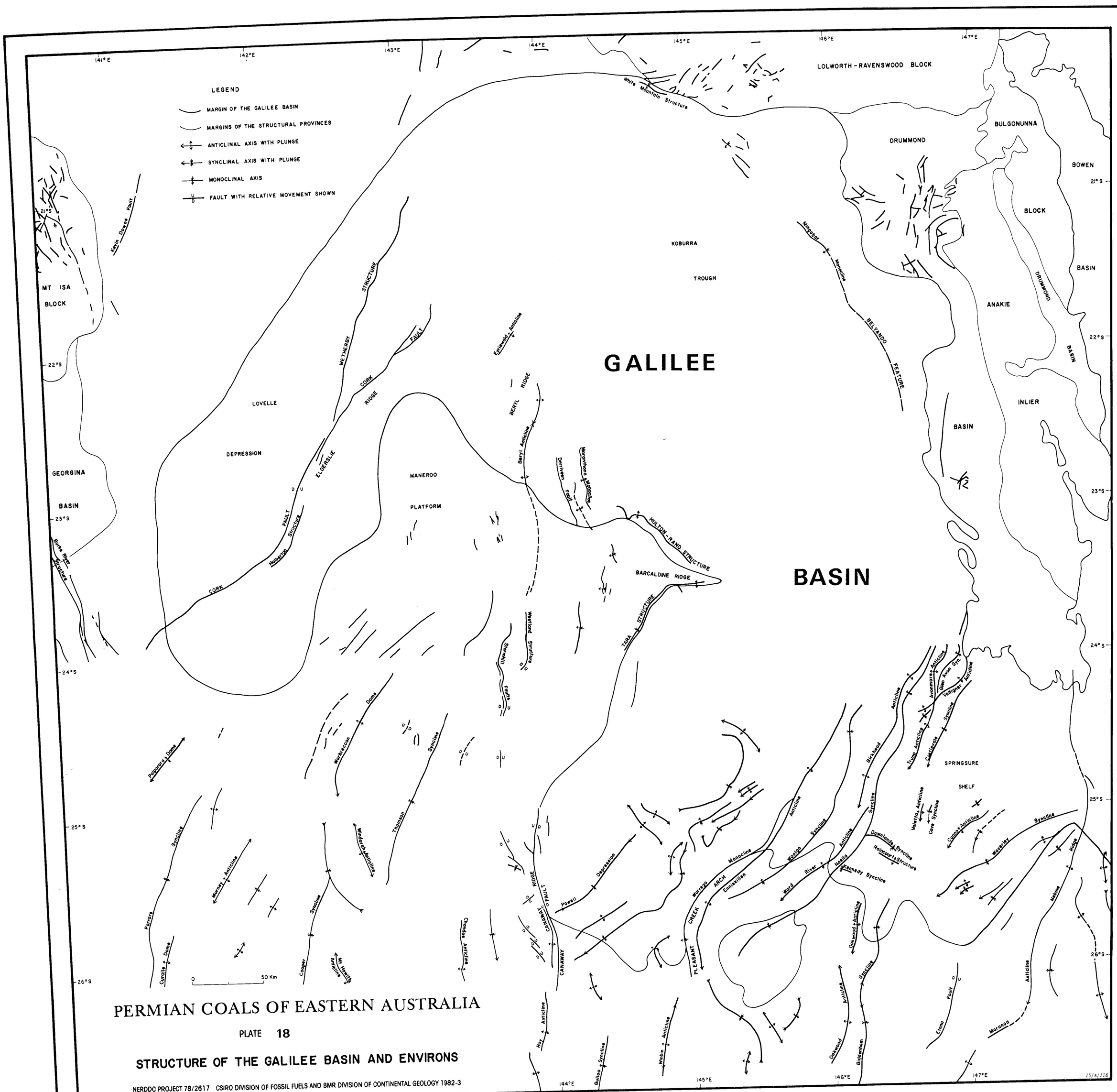
PLATE 17

REGIONAL STRUCTURAL SETTING OF THE COOPER & GALILEE BASINS

NERDDC PROJECT 78/2617

BMR DIVISION OF CONTINENTAL GEOLOGY AND CSIRO DIVISION OF FOSSIL FUELS 1982-3

15/A/120



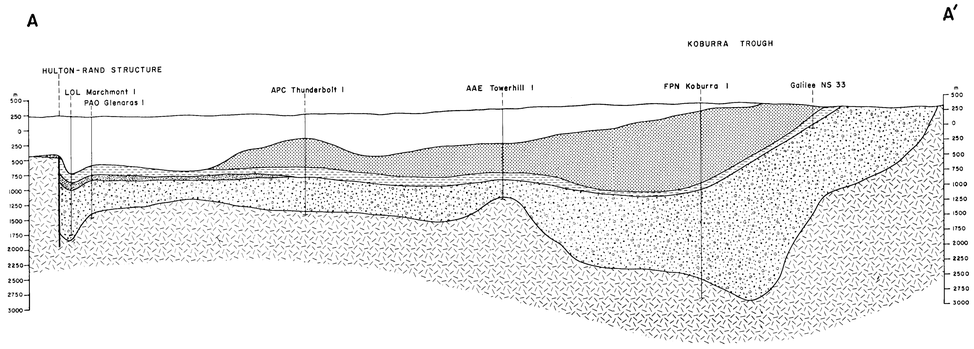
PERMIAN COALS OF EASTERN AUSTRALIA

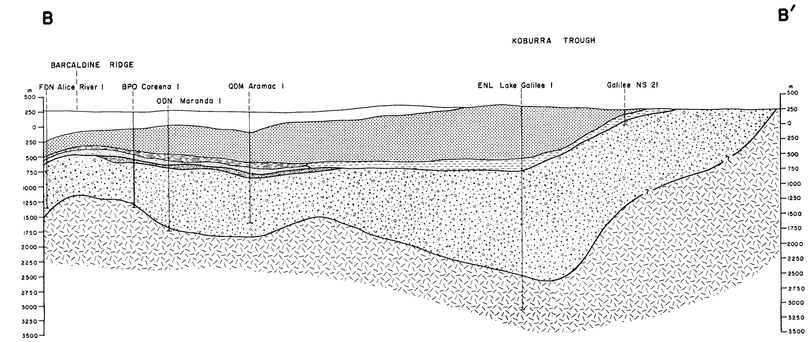
PLATE 18

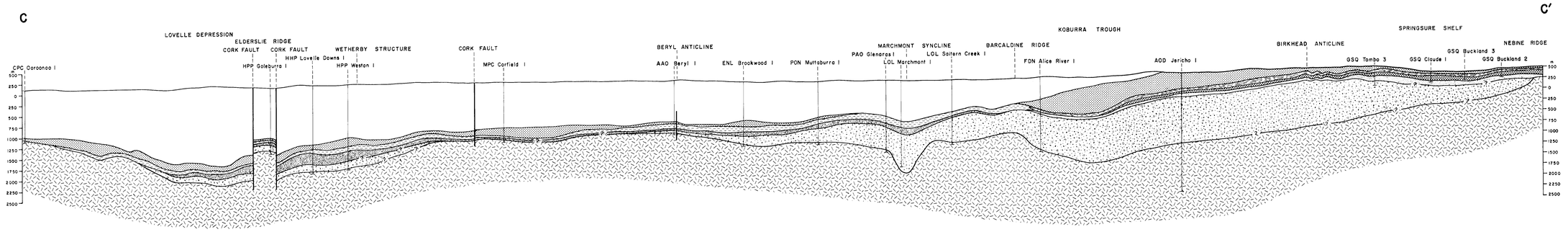
STRUCTURE OF THE GALILEE BASIN AND ENVIRONS

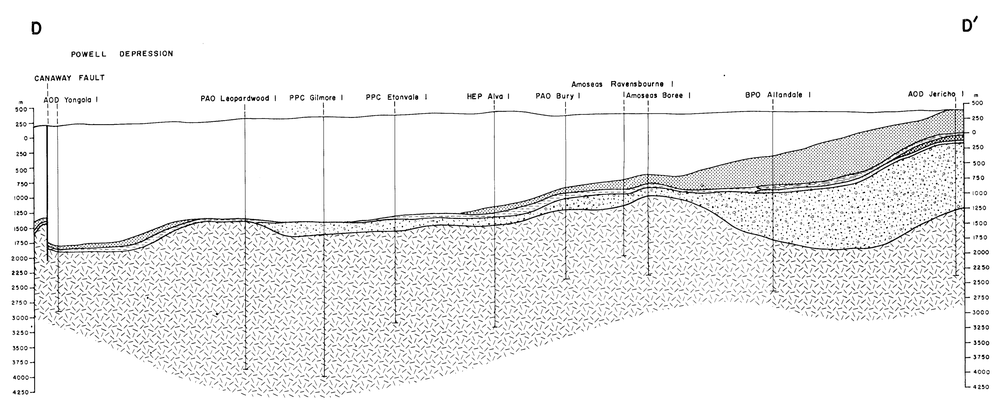
NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

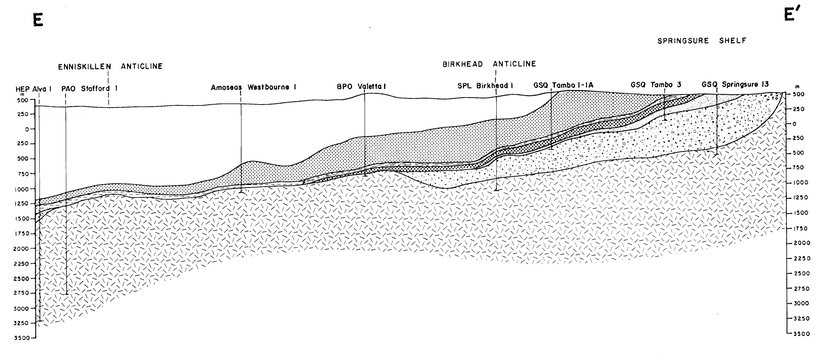
15/A/116











Scale : $\frac{V}{H}$ = 24

0 20 40 60 80 100 km

1 : 1,000,000

Datum : Sea-level
Cainozoic omitted

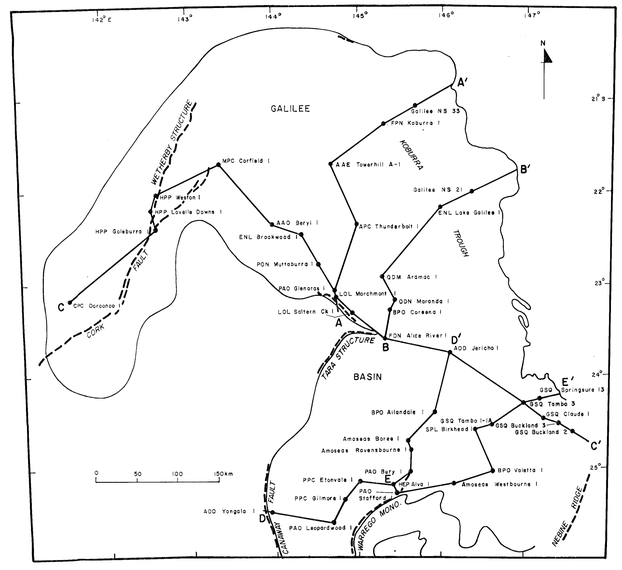
LEGEND

EROMANGA BASIN SEQUENCE

GALILEE BASIN SEQUENCE

- Triassic
  - Undivided
- Late Permian
  - Bandanna Formation equivalent
  - Bandanna Formation
  - Black Alley Shale – Peawaddy Formation
  - Colinlea Sandstone
- Early Permian
  - Aramac Coal Measures
  - Joe Joe Group

BASEMENT — Undivided crystalline and sedimentary rocks



MAP OF GALILEE BASIN SHOWING LOCATIONS OF CROSS-SECTIONS

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 19

GALILEE BASIN CROSS-SECTIONS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

15/A/117

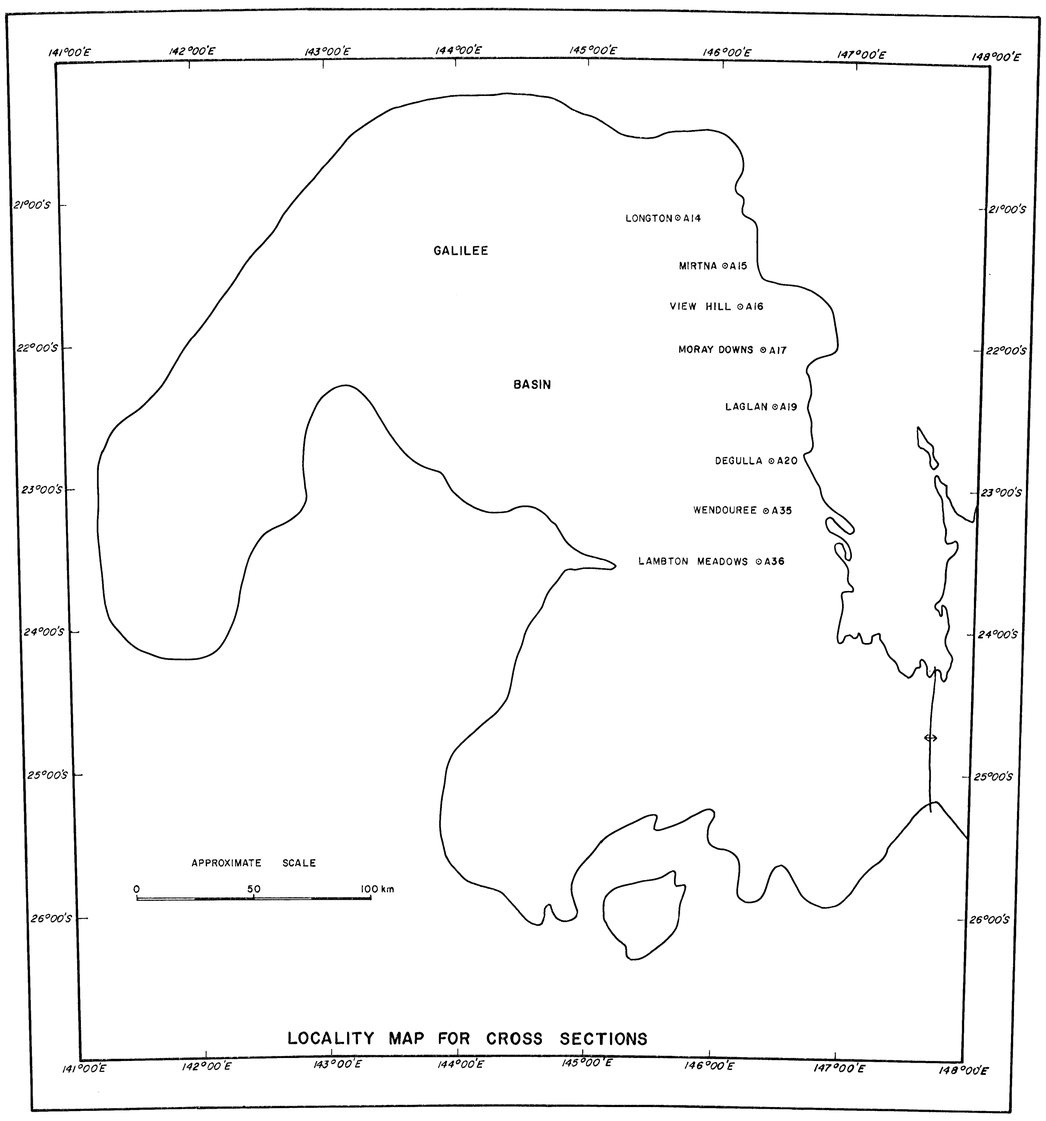
PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 20

CROSS-SECTIONS OF UPPER PERMIAN COAL MEASURES EASTERN MARGIN GALILEE BASIN

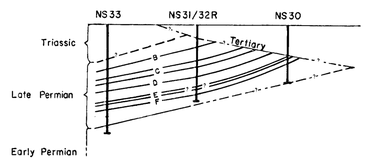
CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

NERDDC PROJECT 78/2617

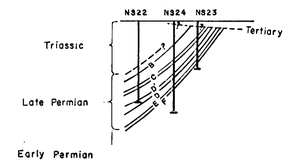


LOCALITY MAP FOR CROSS SECTIONS

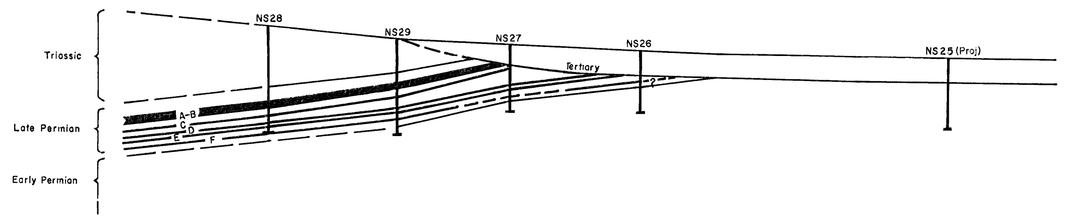
LONGTON



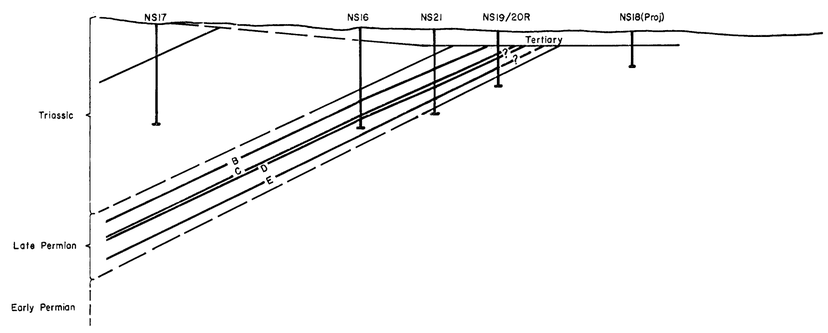
MIRTNA



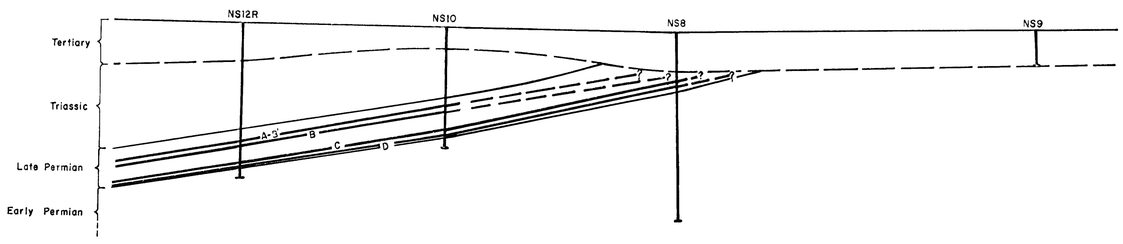
VIEW HILL



MORAY DOWNS

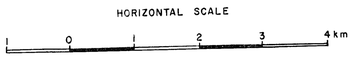


LAGLAN



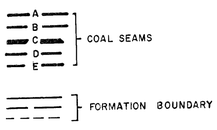
WENDOUREE

HORIZONTAL SCALE



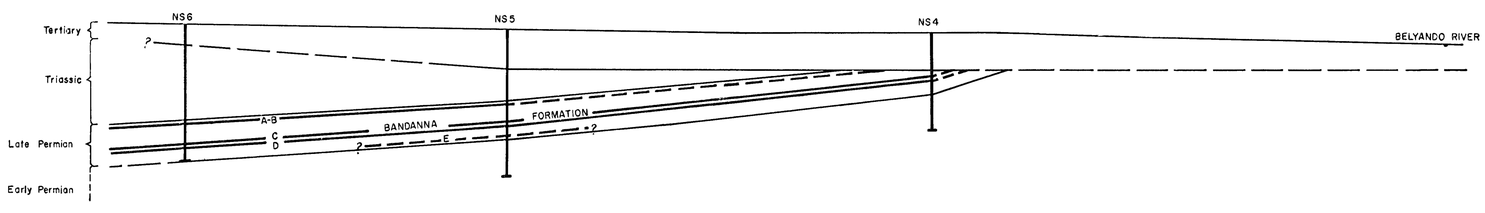
V/H = 5

LEGEND

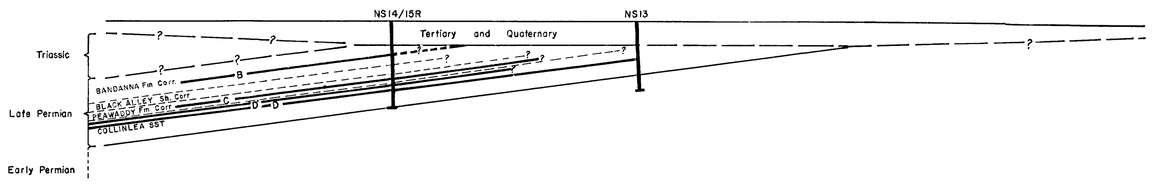


CROSS SECTIONS ADAPTED FROM CARR, 1973, a b, 1974, a, b and c 1976, 1977, 1978.

DEGULLA



LAMBTON MEADOWS



LEGEND

MARGIN OF THE COOPER BASIN

ANTICLINAL AXIS WITH PLUNGE

SYNCLINAL AXIS WITH PLUNGE

MONOCLINAL AXIS

FAULT WITH RELATIVE MOVEMENT SHOWN

0 40 80 Km

SCALE

139°00'E 141°00' 143°00' 24°00S 26°00 28°00 30°00

Palpara Dome
Warbreccan Dome
Stormhill Fault
Syncline
Thomson
Windorah Anticline
Conaway Fault
Morney Anticline
Farrars Dome
Curalle Dome
High
Gilpeppee Td
Little Hills Anticline
Yamma Yamma Syncline
McKilliop Anticline
Syncline
Anticline
Chandos Anticline
Harkaway Anticline
Ray Anticline
Cooper
Mount Howitt
Durham Downs Anticline
Arrabury Low
Karmona Dome
Innamincka Trend
Trough
Jackson Anticline
Wilson Depression
Chesson Anticline
Fly L. - Braiga Trend
Tirrawarra Trend
Merrimelia Innamincka Trend
Patchawarra
Gidgealpa
Nappamerri Trough
Orientos Complex
Tickalara Trend
Wolgolla Trend
Murteree Nappacoongee Trough
Toolachee Trend
Anticline
Naryilco Anticline
Wompah
Kopperamanna - Warbreccan
Kopperamanna - Naryilco
Tennapera High

PERMIAN COALS OF EASTERN AUSTRALIA

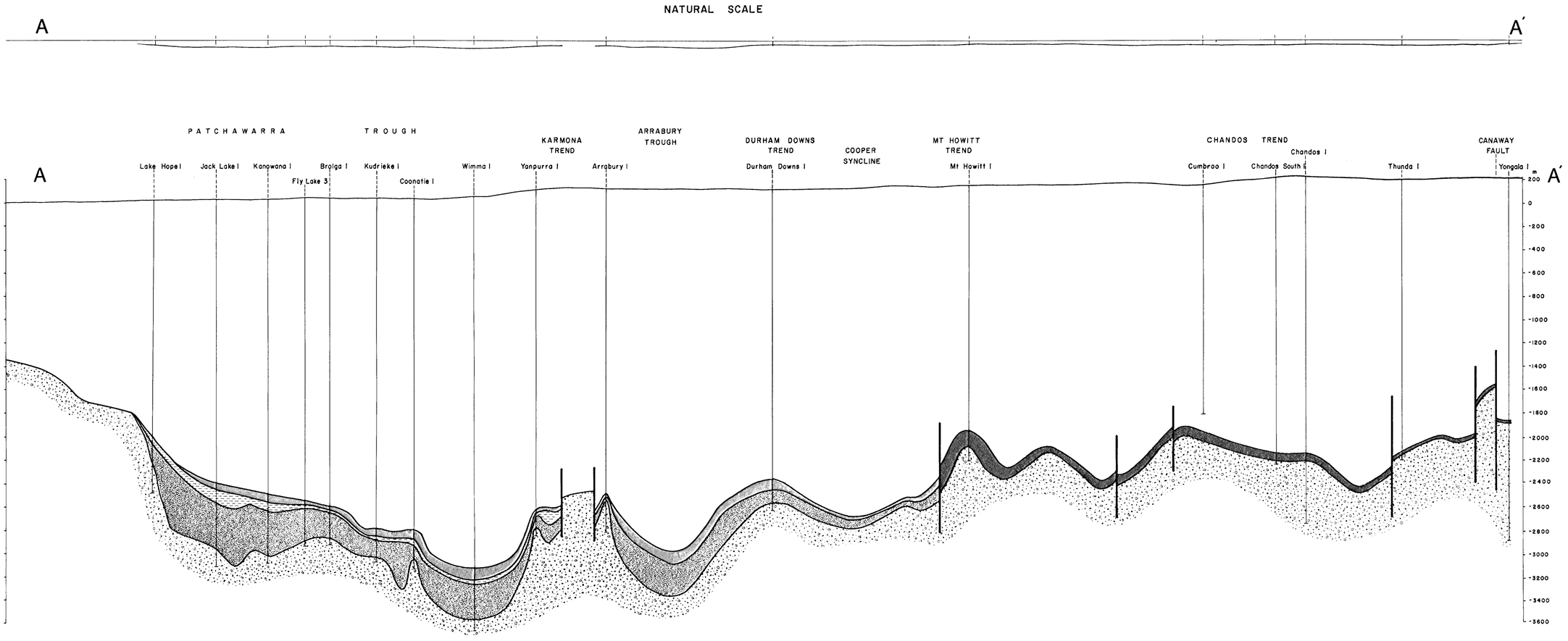
PLATE 21

STRUCTURE OF THE COOPER BASIN AND ENVIRONS

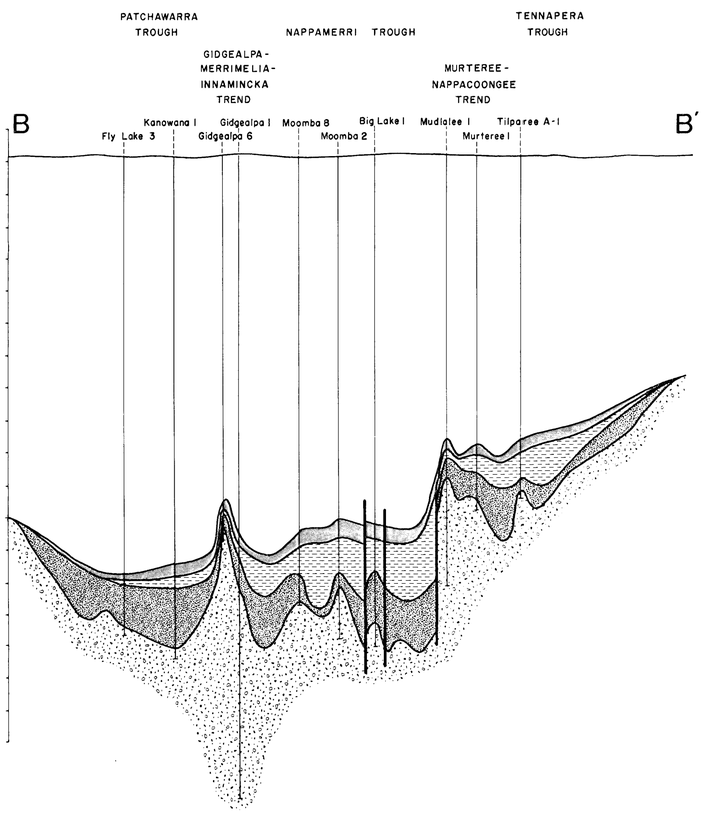
NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

15/A/119

NATURAL SCALE



NATURAL SCALE



Scale : $\frac{V}{H} = 50$

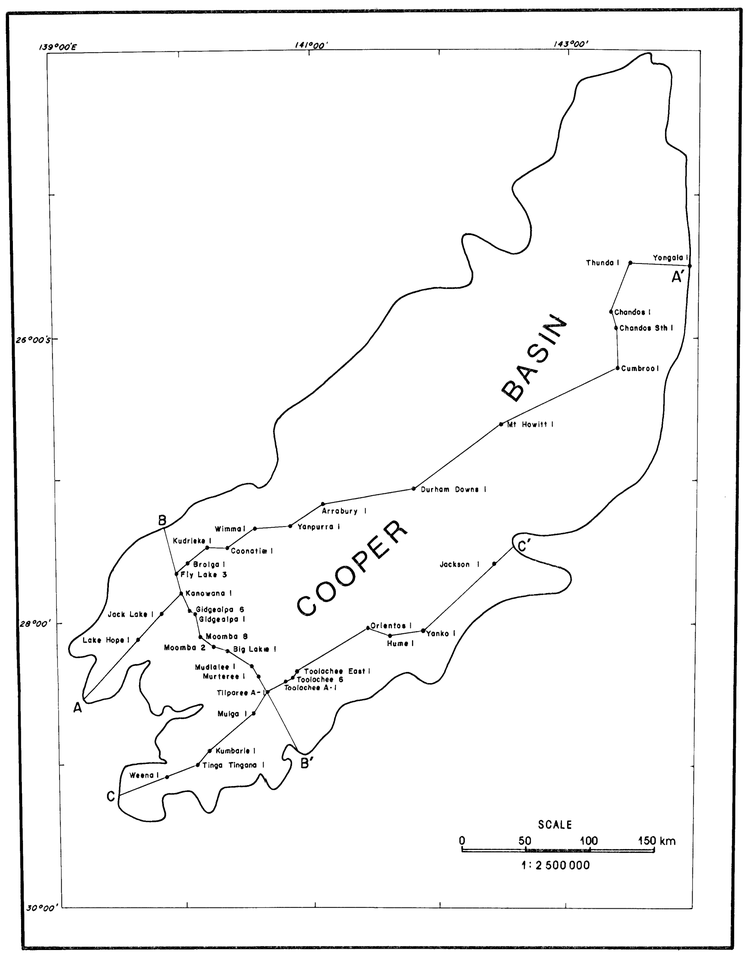
0 20 40 60 80 100 Km

1 : 1 000 000

Datum : Sea-level
Cainozoic omitted

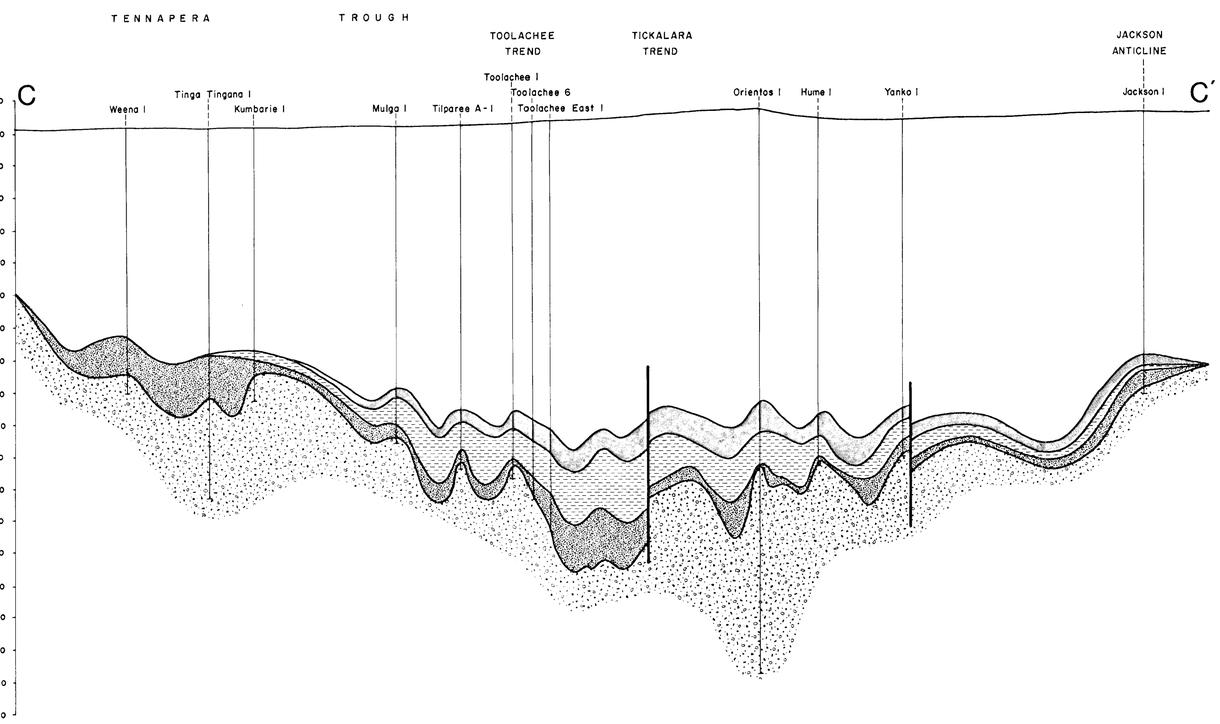
LEGEND

- Post Permian
- Toolachee Formation
- Daralingie Beds / Roseneath Shale / Epsilon Formation / Murteree Shale
- Patchawarra Formation
- Undifferentiated Gidgealpa Group
- Pre-Patchawarra Formation (Tirrawarra Sst., Merrimelia Fm., Basement)



MAP OF COOPER BASIN SHOWING LOCATION OF CROSS - SECTIONS

NATURAL SCALE



PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 22

COOPER BASIN CROSS - SECTIONS

NERDDC PROJECT 78/2617

CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

15/A/121

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 23

CONTROL POINTS FOR COAL RANK STUDIES

SCALE 0 50 100 150 km

NERDDC PROJECT 78/2617

CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

10868

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 24

ISOREFLECTANCE MAP OF ROCKS EXPOSED AT SURFACE

SCALE
0 50 100 150 km
1 : 2 500 000

NERDDC PROJECT 78/2617
CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

10869

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 25

ISOREFLECTANCE MAP OF UPPER PERMIAN COAL MEASURES

SCALE
0 50 100 150 km
1 : 2 500 000

NERDDC PROJECT 78/2617
CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

10871

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 26

REFLECTANCE TRENDS, LOWER PERMIAN COAL MEASURES

SCALE
0 50 100 150 km
1: 2 500 000

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10870

INTENSE COALIFICATION

ISOLATED LOCALITIES OF LOWER RANK

0.4% SURFACE REFLECTANCE

0.6% SURFACE REFLECTANCE

1% SURFACE REFLECTANCE

REGION OF MINOR POST PERMIAN TECTONISM

REGION OF LITTLE POST PERMIAN TECTONISM

MOOKI FAULT ZONE

ZONE OF ECONOMIC COAL (0.6-1.0%) NEAR SURFACE

ZONE OF UPLIFT GREATER THAN 1 km

SCALE 0 50 100 150 km

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 27

INTERPRETATIVE MAP, COAL RANK TRENDS

NERDDC PROJECT 78/2617
CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

10872

INDIVIDUAL MINES AND PROSPECTS

(see Table 22-2 for further and updated information)

LEASES MINES & PROSPECTS (with map reference number)	TYPE OF OPERATION	STRATIGRAPHIC UNIT
	O Open Cut Mine U Underground Mine P Prospect D Under Development C Colliery Holding * Not Operating	
1 Bowen No 2	U	Collinsville CM
1 Bowen No 3	O,U	"
1 Dacon No 4	O	"
2 Newlands	D	Moranbah CM
2 Eastern Creek North	P	Rangal CM
2 Eastern Creek South	P	"
3 Lancewood	P	Moranbah CM
3 Wards Wells	P	"
4 Riverside	D	"
4 Goonyella	O	"
5 Hail Creek	P	Rangal CM
6 Bee Creek	P	"
7 Kemmis Walker	P	"
8 Winchester	P	Rangal CM, Fort Cooper CM
8 Winchester South	P	"
8 Poitrel	P	Rangal CM
8 Daunia	P	"
9 Peak Downs	O	Moranbah CM
9 Harrow Creek	U	"
10 Saraji	O	"
11 Norwich Park	O	German Creek FM
12 Blair Athol	O	Blair Athol CM
13 German Creek	O	German Creek FM
14 Oaky Creek	O	"
15 Gregory	O	"
16 Yarrabee	O	Rangal CM
17 Bluff Extended	P	"
17 New Windsor	P	"
17 Excel	P	"
17 Cambria	P	"
17 Windsor No 2	P	"
18 Blackwater Mine	O	"
18 Leichhardt	U,*	"
18 Cook	U,*	"
18 Wilpaena	P	"
18 Terang	P	"
18 South Blackwater Mine	O,U	"
18 Togara	P	"
18 Sirius Creek	`	"
18 Ballamoo	P	"
18 El Dorado Hill	P	"
19 Baralaba Area	P	Baralaba CM
20 Moura No 2	U	"
20 Moura No 4	U	"
20 Moura Open Cut	O	"
20 Kianga Open Cut	O	"
21 Theodore	P	"
22 Ashford Open Cut	O,*	Ashford CM
23 Gunnedah No 2	U	Black Jack FM
23 Preston & Preston Ext Tunnel	U	"
24 Werris Creek		Werris Creek CM
25 Ulan No 2	U	Illawarra CM
26 Bayswater No 2	O	Wittingham CM
26 Drayton	D	"
26 Durham North	*	"
26 Foybrook	O	"
26 Howick Open Cut	O	"
26 Hunter No 1		"
26 Hunter Valley No 1	O	"
26 Liddell	U	"
26 Liddell SCM	U	"
26 Muswellbrook No 1	U	Greta CM
26 Muswellbrook No 2	U,O	"
26 Ravensworth No 2	O	Wittingham CM
26 Swamp Creek	O	"
27 Buchanan Lemington	O	"
27 Saxsonvale	O	"
27 Wambo	O,U	"
28 New Main (Arydale)	O,U	"
29 Aryfield No 3	*	Greta CM
30 Aberdare East	U	"
30 Aberdare North	U	"
30 Bellbird	C*	"
30 Maitland Main	C*	"
30 Millfield	C*	"
30 Millfield North	C*	"
30 Pelton	U	"
30 Ellalong	U	"
30 Stanford Main No 2	*	"
31 Belmont	*	Newcastle CM
31 Bloomfield Open Cut	O	Tomago CM
31 Bloomfield (Rathluba)	U	"
31 Bloomfield Underground Mine	U	"
31 Burwood	*(1982)	Newcastle CM
31 Cardiff Borehole	C*	"
31 Gretley	U	Tomago CM
31 Delta No 1	U	"
31 Ironbark	C*	"
31 John Darling	U	Newcastle CM
31 Lambton	U	"
31 Macquarie	U	"
31 Mount Sugarloaf	C*	"
31 Newstan	U	"
31 Northern	C* (1981)	"
31 Stockrington No 2	U	"
31 Stockton Borehole	U	"
31 Wallsend Borehole	O	"
31 Wallsend Borehole No 2	U	"
31 Waratah	C*	"
31 West Wallsend	U	"
32 Awaba SCM	U	"
32 Cooranbong	U	"
32 Myuna	U	"
33 Chain Valley	U	"
33 Munmorah SCM	U	"
33 Newvale	U	"
33 Newvale No 2	U	"
33 Wallarah	C,D	"
33 Wallarah	U	"
33 Wyee SCM	U	"
34 Charbon	U	Illawarra CM
34 Clandulla	C*	"
34 Kandos No 3	U	"
35 Angus Place	U	"
35 Eastern Main No 1	U	"
35 Invincible	U	"
35 Ivanhoe Open Cut	O	"
35 Ivanhoe No 2	U	"
35 Wallerawang	U	"
35 Western Main	O,U	"
36 Blue Mountains	C*	"
36 Clarence	U	"
36 Hartley Main Nos 1 & 2	C*	"
36 Hartley Main No 4	U	"
36 Hartley Valley	C*	"
36 Hermitage	U	"
36 Lithgow Valley	C*	"
37 Brimstone No 1	U	"
37 Brimstone No 2	U*	"
37 Nattai Bulli	U	"
37 Nattai North	U	"
37 Nattai North No 2	U	"
37 Oakdale	U	"
37 Wollondilly	C*	"
38 Valley No 1 — No 2 Entry Mine	U*	"
38 Valley No 3	U	"
39 Bargo	P	"
39 Tahmoor	U	"
40 Appin	U	"
40 Avon	U	"
40 Avondale	U	"
40 Bulli	U	"
40 Bulli Main	C*	"
40 Coal Cliff	U	"
40 Cordeaux	U	"
40 Corrimal	U	"
40 Darkes Forest	U	"
40 Huntley	U	"
40 Kemira	U	"
40 Metropolitan	U	"
40 Nebo	U	"
40 South Bellambi	C*	"
40 South Bulli	U	"
40 South Clifton	U	"
40 Tower	U	"
40 West Cliff	U	"
40 Wongawilli	U	"
41 Tongarra	C*	"
41 Yellow Rock	U	"
42 Mount Alexander	C*	"
43 Berrima	U	"
43 Loch Catherine	C*	"
44 Southern	C*	"
45 Murrimba	C*	"
46 Stratford-Wards River	P	Gloucester CM
47 Oaklands	P	Corrabin CM
48 Mount Mulligan, King Cole	C*	Mount Mulligan CM

15/A/122

PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 28

MINING AREAS

(detailed mining maps are updated and published regularly by the Queensland Department of Mines and the New South Wales Department of Mineral Resourses)

NERDDC PROJECT 78/2617
CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

PERMIAN COALS OF EASTERN AUSTRALIA

NERDDC PROJECT 78/2617
CSIRO AND BMR 1988

PLATE 29

COAL RESOURCES OF AUSTRALIA

Reprinted 1988 by Watson Ferguson & Co., Brisbane.

AUSTRALIA
1983

SCALE 1:10 000 000

0 100 200 300 400 500
KILOMETRES

Simple Conic Projection with Standard Parallels 18°S and 36°S

Published by the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development and Energy
Base map supplied by the Division of National Mapping
© Commonwealth of Australia 1983

Compiled by A.T. Wells
Edited by G.W. D'Addario, A.S. Mikolajczak
Design and drafting by Cartography Section, BMR
Colour Design by R.A. Swoboda
Drawn by G. Butterworth
Printed by Mercury-Walch, Hobart, Australia

INDONESIA
PAPUA NEW GUINEA
ARAFURA SEA
TIMOR SEA
SAVU SEA
TORRES STRAIT
SOLOMON SEA
CORAL SEA
GULF OF CARPENTARIA
INDIAN OCEAN
PACIFIC OCEAN
SOUTHERN OCEAN
GREAT AUSTRALIAN BIGHT
TASMAN SEA
NORTHERN TERRITORY
WESTERN AUSTRALIA
SOUTH AUSTRALIA
QUEENSLAND
NEW SOUTH WALES
VICTORIA
TASMANIA

DARWIN
FITZROY
BONAPARTE GULF
OLIVE RIVER
LAURA
MOUNT MULLIGAN
EXMOUTH PLATEAU
CARNARVON
HALE RIVER
GALILEE
EROMANGA
PEDIRKA
COOPER
ARCKARINGA
LAKE PHILLIPSON
EASTERN EUCLA
LEIGH CREEK
BOOLCUNDA
SPRINGFIELD
NORTHERN ST VINCENT COALFIELD
POLDA
BOWER
ANNA-SEDAN
HOPE VALLEY
MOORLANDS
NOARLUNGA
CEDUNA TERRACE
BYRO
PERTH
KALGOORLIE
BALLADONIA-ZANTHUS
COLLIE
WILGA
BREMER
KINGSTON
ALTONA-BACCHUS MARSH
LATROBE VALLEY
STRADBROKE
GIPPSLAND
GELLIONDALE
WONTHAGGI
OTWAY
ANGLESEA
FINGAL VALLEY
BASS STRAIT
CALEN
STYX
WOLFANG
BLAIR ATHOL
WATERPARK CREEK
CAPRICORN
BOWEN
CALLIDE
MULGILDIE
BURRUM
MARYBOROUGH
TIARO
TARONG
SURAT
IPSWICH
ASHFORD
CLARENCE – MORETON
GUNNEDAH
LORNE
GLOUCESTER
SYDNEY
OAKLANDS – COORABIN
GRIFFITH

COAL MEASURES

age (m.y.)			Outcrop	Shallow < 600 m	Deep > 600 m
0	CAINOZOIC	TERTIARY			
100	MESOZOIC	CRETACEOUS			
200	MESOZOIC	JURASSIC			
	MESOZOIC	TRIASSIC			
300	PALAEOZOIC	PERMIAN			
	PALAEOZOIC	CARBONIFEROUS			

Production of raw coal ($x10^6$ tonnes) in year 1980

0 — 32.9
0 — 0.01
0 — 8.86
0 — 84.54

JURASSIC
TRIASSIC
PERMIAN

Approximate margin of Coal Province
Concealed margin of Coal Province beneath younger coal-bearing strata, colour hachures indicate relevant age
Uncertain margin of Coal Province
Unknown limit of Coal Province
Igneous rocks locally affecting coal seams
SYDNEY *Coal Province*
Anticline
Syncline
Monocline
Closely spaced folds
Fault
Thrust fault

COAL RESOURCES

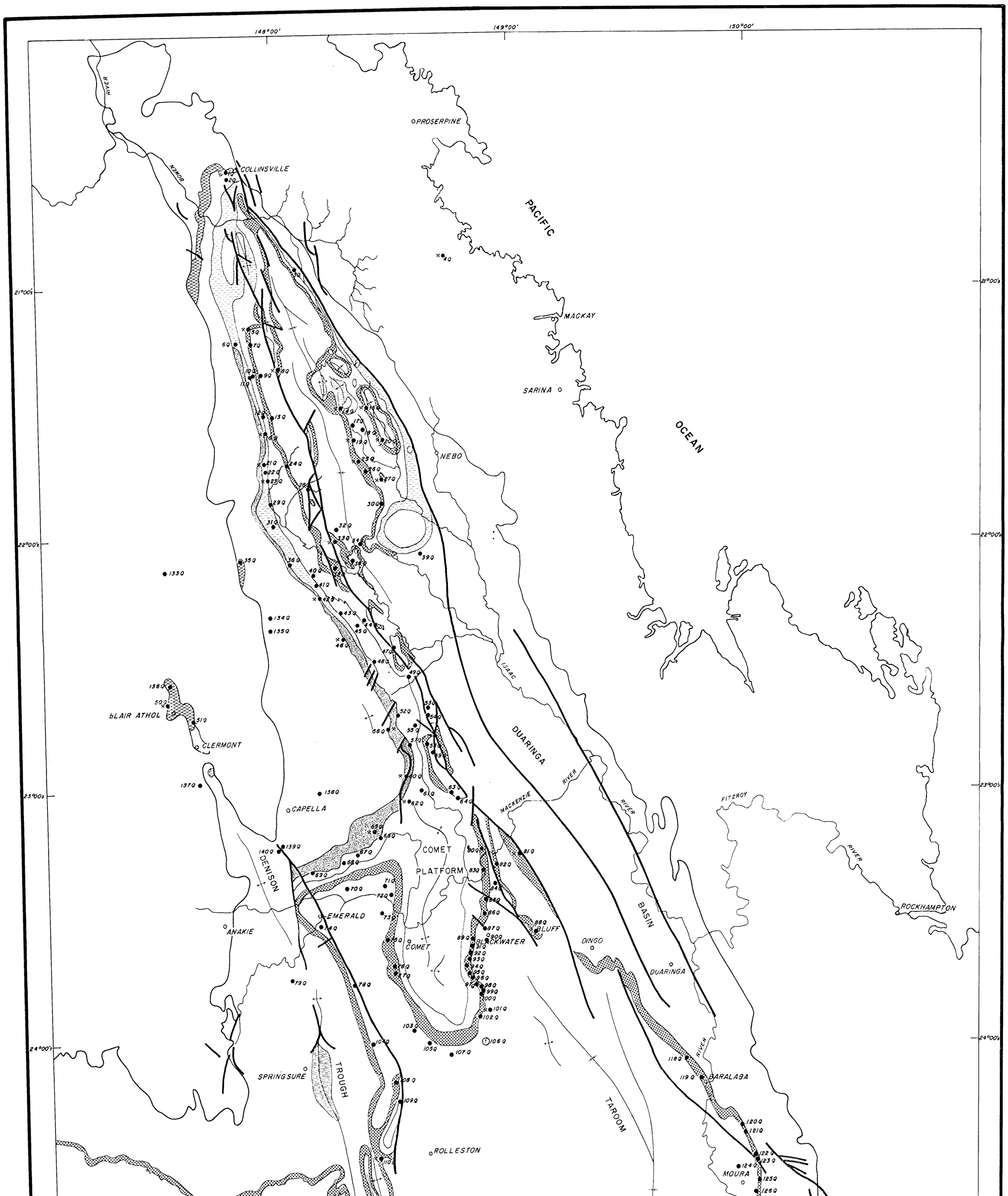
* No inferred resources figures available for Queensland

D — *demonstrated in situ*
I — *inferred in situ*
Coal resources ($x10^6$ tonnes) as of December 1981; age indicated by colour. State and Australian resource totals; where provinces are combined, are shown in grey

WESTERN AUSTRALIA		TASMANIA	SOUTH AUSTRALIA									QUEENSLAND						VICTORIA				NEW SOUTH WALES			AUSTRALIA	
Collie		Fingal Valley	Polda	Anna-Sadan	Leigh Creek	Kingston	Northern St Vincent Coalfield	Lake Phillipson	North Arckaringa	SA Total		QLD Total	Callide	Tarong	Ipswich	Gallilee	Surat, Clarence - Moreton	Bowen	Altona-Bacchus Marsh	Anglesea	Stradbroke	Gelliondale	Latrobe Valley-Gippsland	VIC Total	Oaklands-Coorabin	Sydney-Gunnedah	NSW Total	Brown Coal	Black Coal
D 496	I 1540	D 139	I 200	D 212	D 120	I 300	I 970	D 2000	D 600	D 830	I 3671	D ? * 27 998	D 225	D 280	D 490	I 1600	D 2548	D 22 836	D 100	I 7500	D 440	D 2800	D 1300	I 4300	D 107 222	D 111 862	I 11 800	D 500	I 10 000	D 22 206	I 479 761	D 22 743	I 490 036	D + I 127 700	D + I 546 000

BMR EARTH SCIENCE ATLAS

COAL

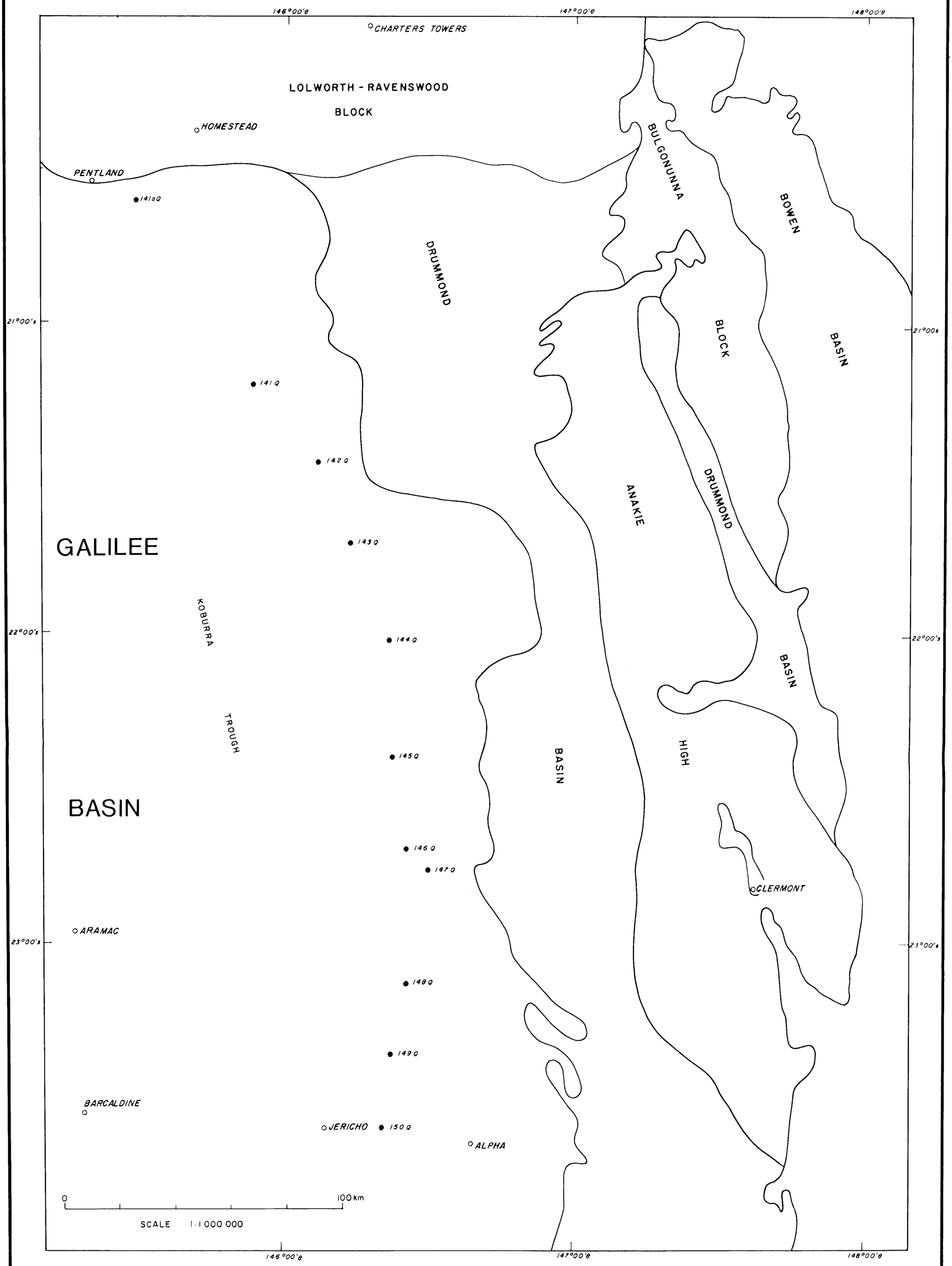


PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 30

COAL QUALITY CONTROL POINTS
BOWEN, BLAIR ATHOL AND WOLFANG BASINS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

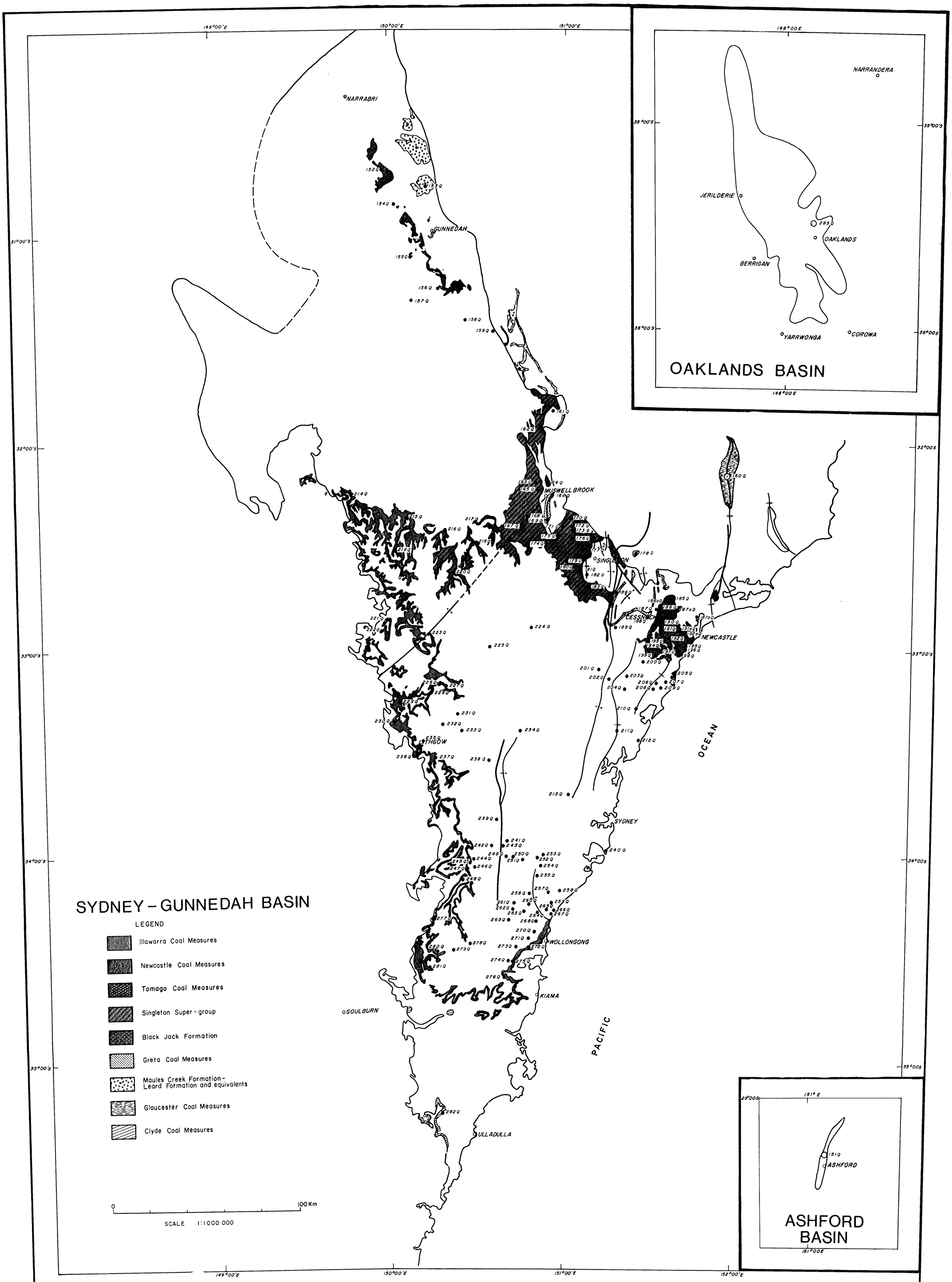


PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 31

COAL QUALITY CONTROL POINTS - GALILEE BASIN

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

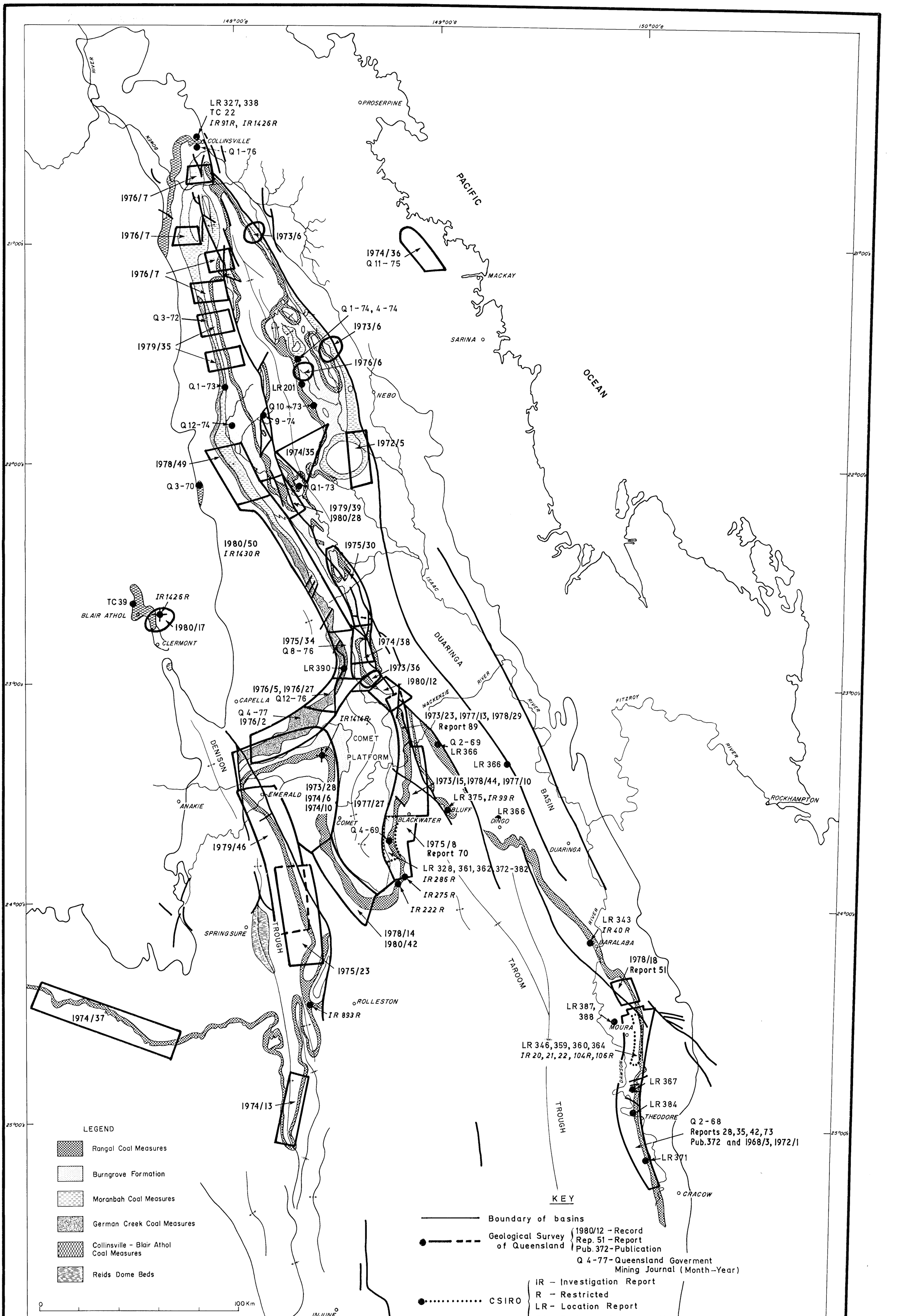


PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 32

COAL QUALITY CONTROL POINTS
ASHFORD, GUNNEDAH, SYDNEY, GLOUCESTER AND OAKLANDS BASINS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3



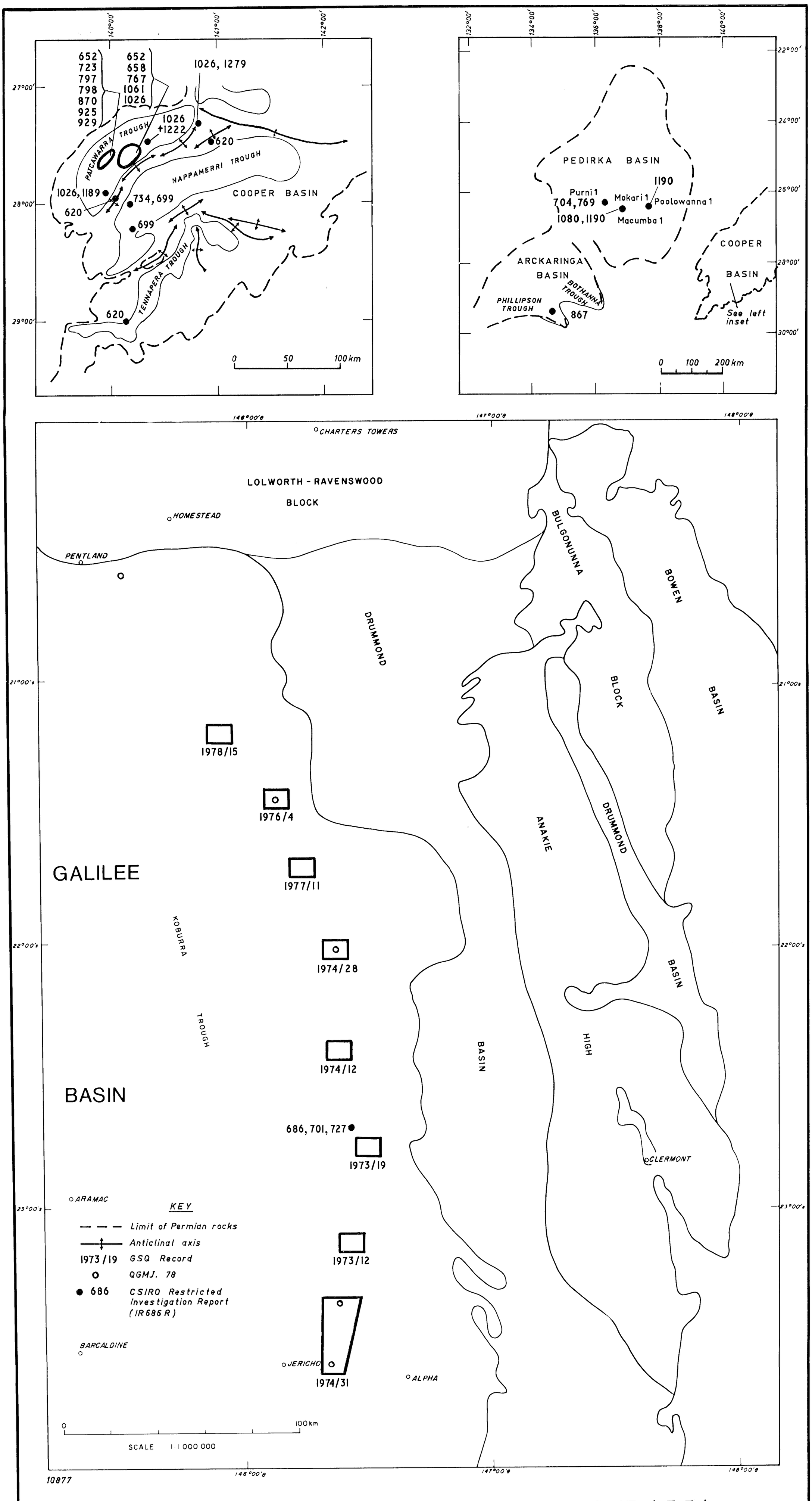
PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 33

SOURCES OF DATA

BOWEN, BLAIR ATHOL AND WOLFANG BASINS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3



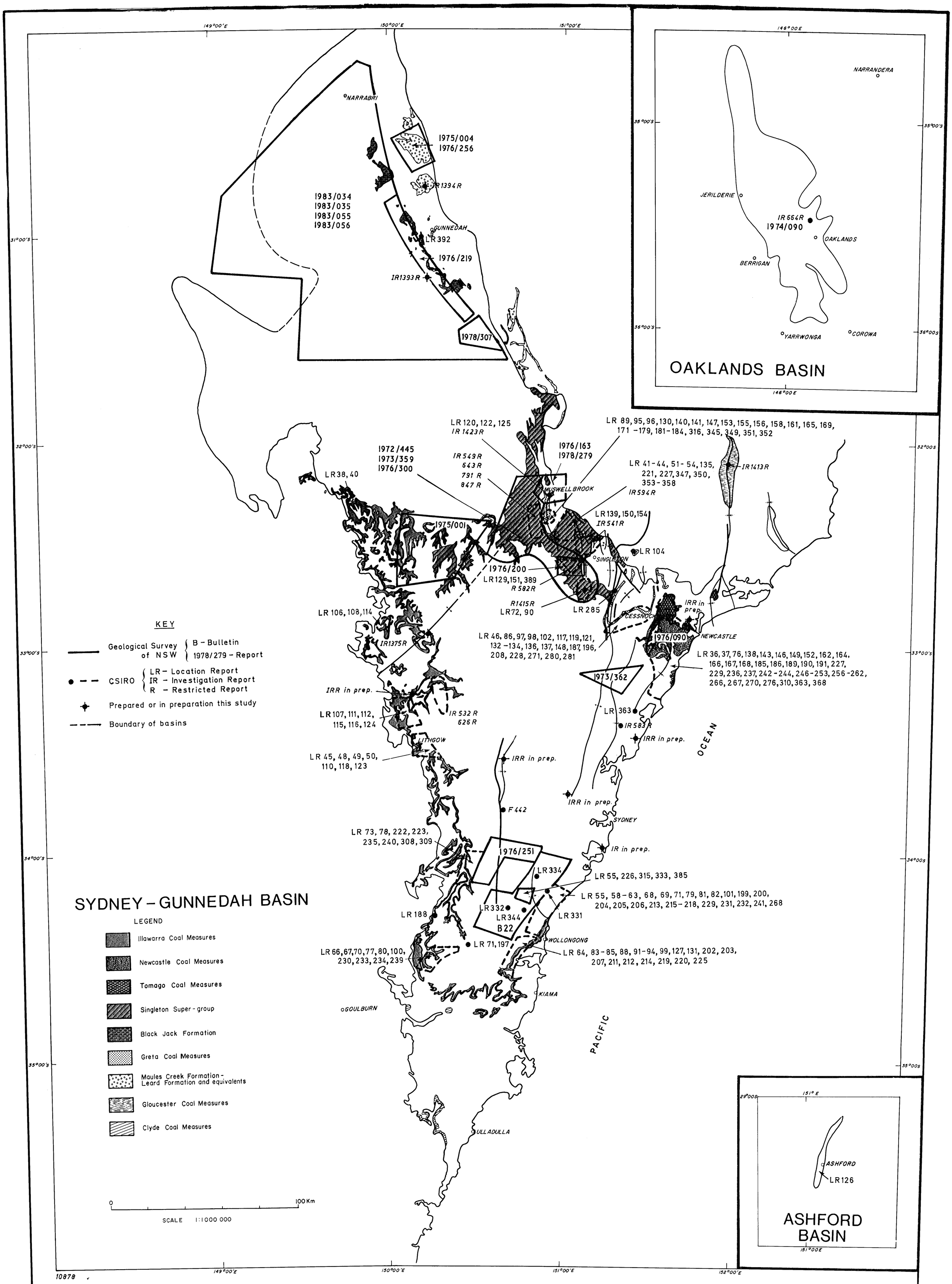
PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 34

SOURCES OF DATA

GALILEE, PEDIRKA, ARCKARINGA AND COOPER BASINS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3



PERMIAN COALS OF EASTERN AUSTRALIA

PLATE 35

SOURCES OF DATA

ASHFORD, GUNNEDAH, SYDNEY, GLOUCESTER AND OAKLANDS BASINS

NERDDC PROJECT 78/2617 CSIRO DIVISION OF FOSSIL FUELS AND BMR DIVISION OF CONTINENTAL GEOLOGY 1982-3

SCALE 1: 1000000

OLIVE RIVER - LAURA

PLOTTED WED., 11 MAY , 1983

SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

WITH STANDARD PARALLELS -11° 00′ AND -15° 00′

PLATE 36

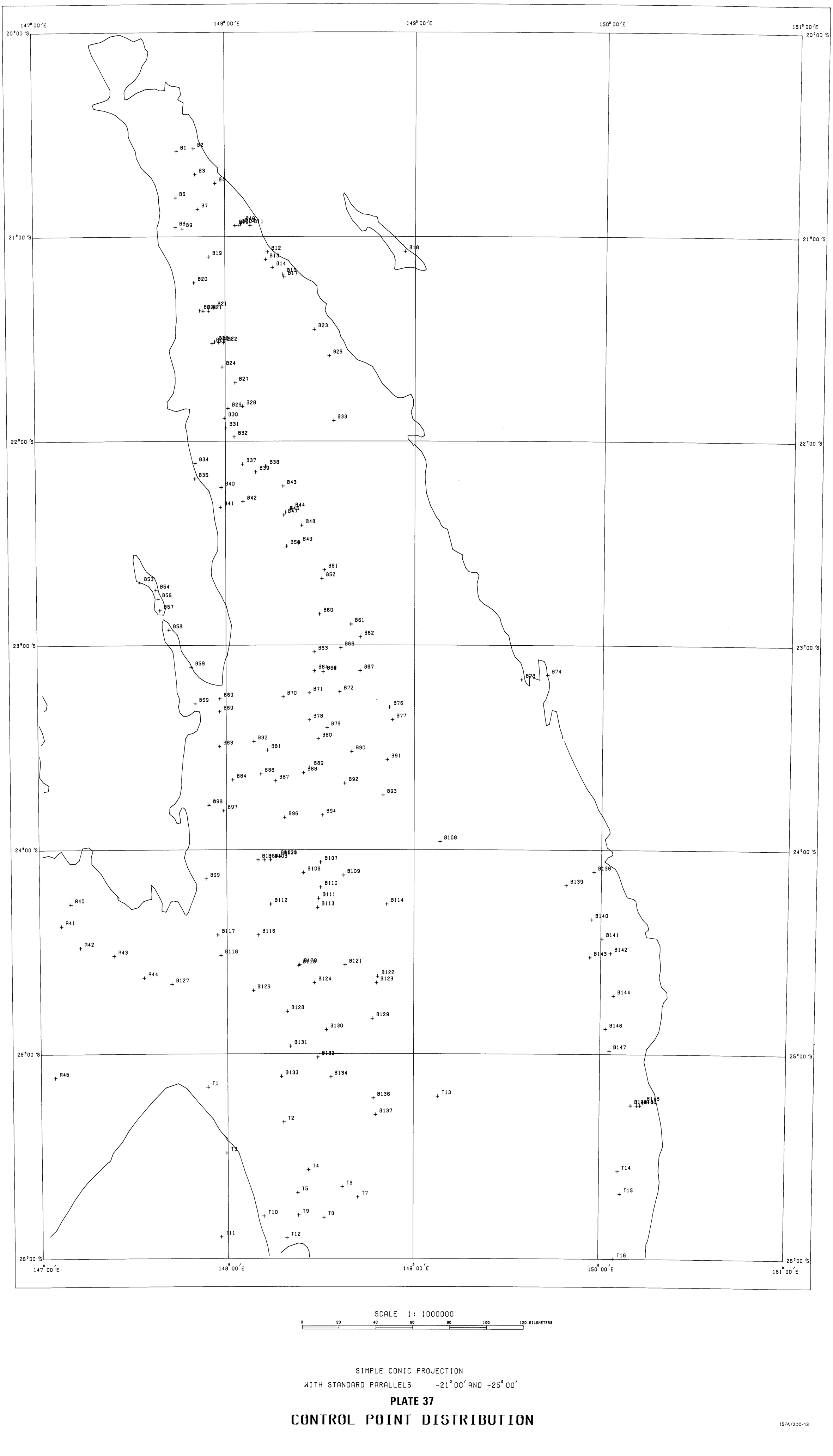
CONTROL POINT DISTRIBUTION

15/A/200-12

SCALE 1: 1000000

BOWEN BASIN

PLOTTED WED., 11 MAY , 1983



SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

WITH STANDARD PARALLELS -21° 00′ AND -25° 00′

PLATE 37

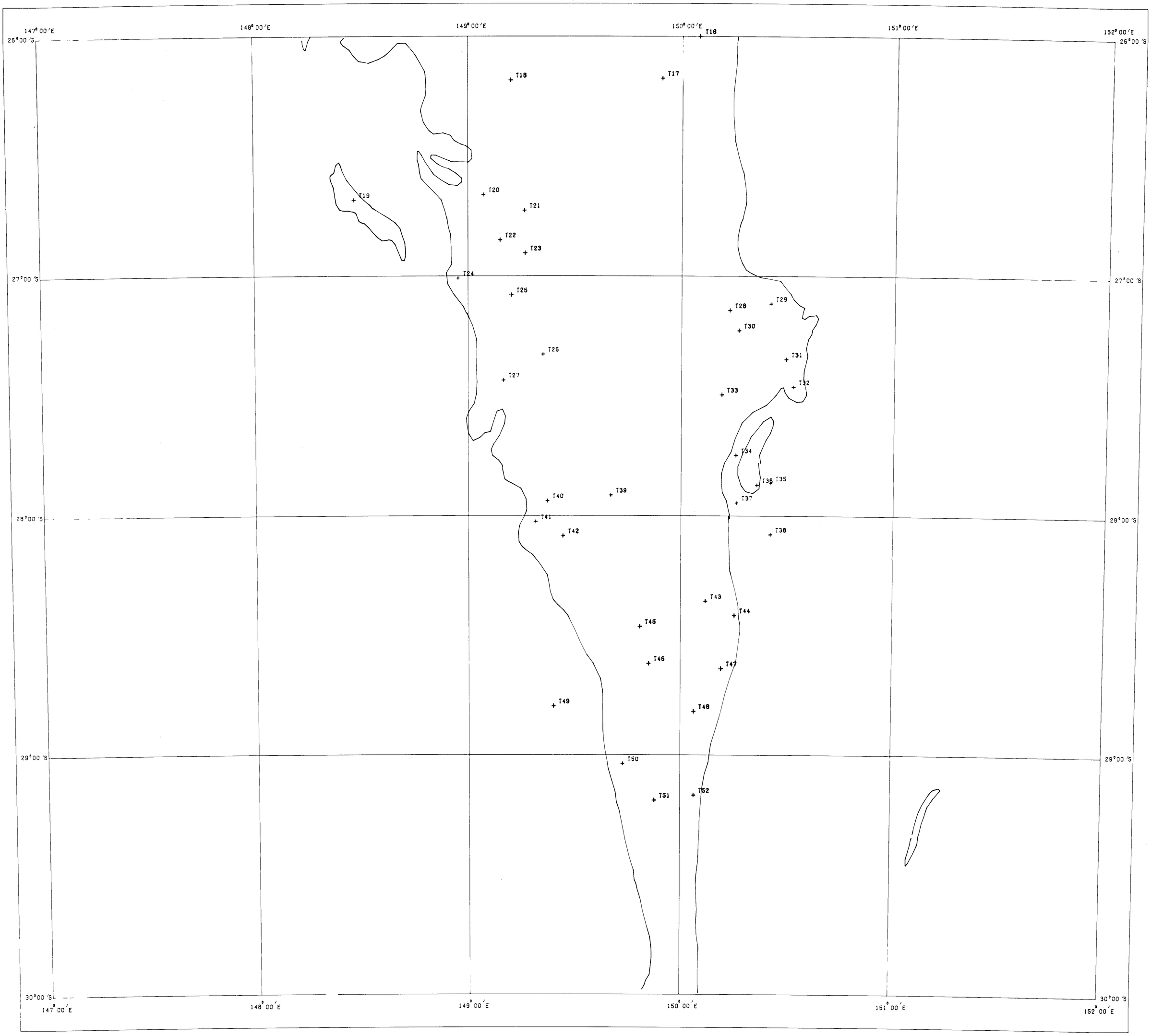
CONTROL POINT DISTRIBUTION

15/A/200-13

SCALE 1: 1000000

BULLI SUB-SCRAL REGION

PLOTTED WED., 11 MAY , 1983



SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

WITH STANDARD PARALLELS -25° 00′ AND -29° 00′

PLATE 38

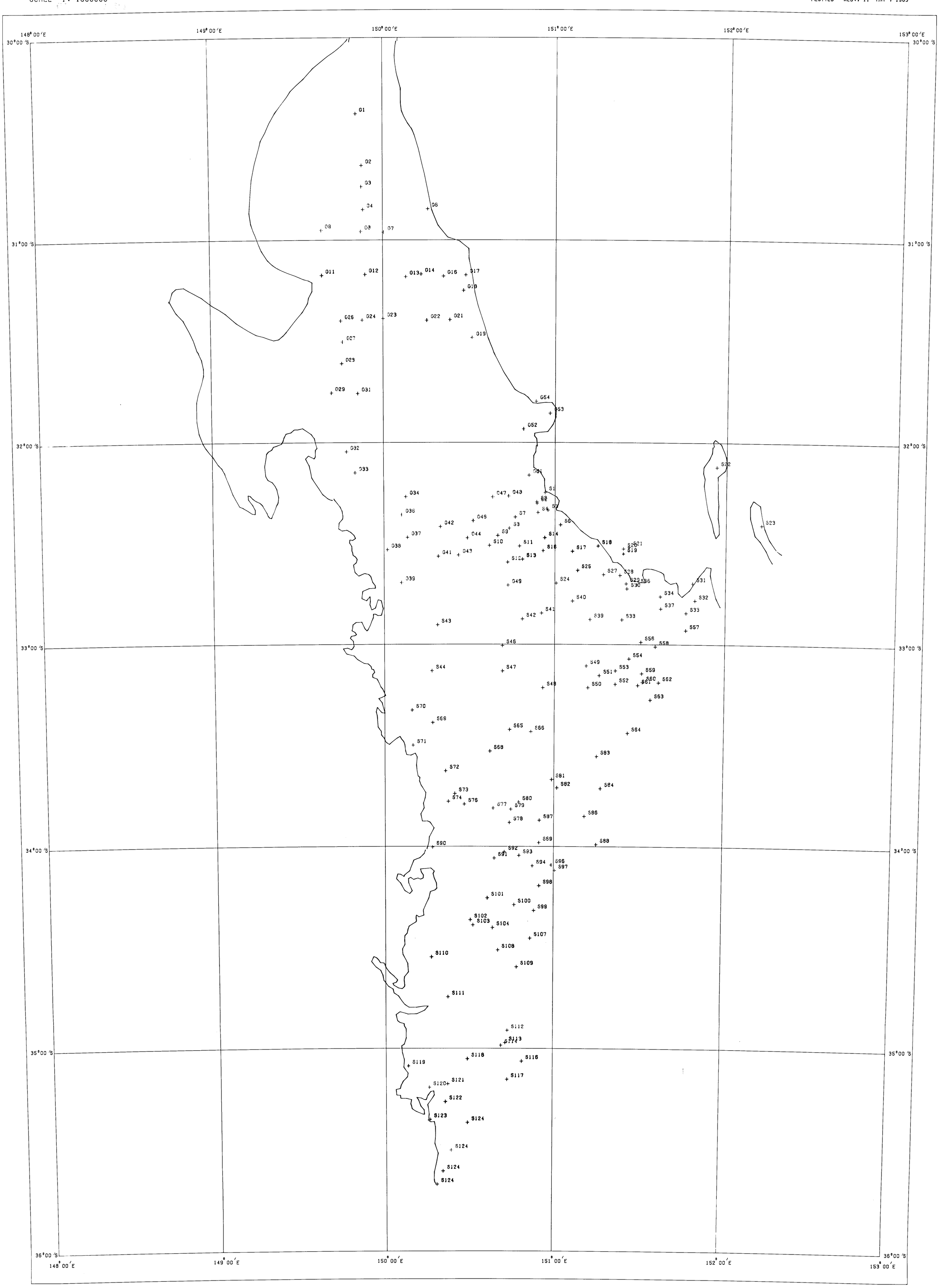
CONTROL POINT DISTRIBUTION

15/A/200-14

SYDNEY-GUNNEDAH BASINS

SCALE 1: 1000000

PLOTTED WED., 11 MAY , 1983



SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

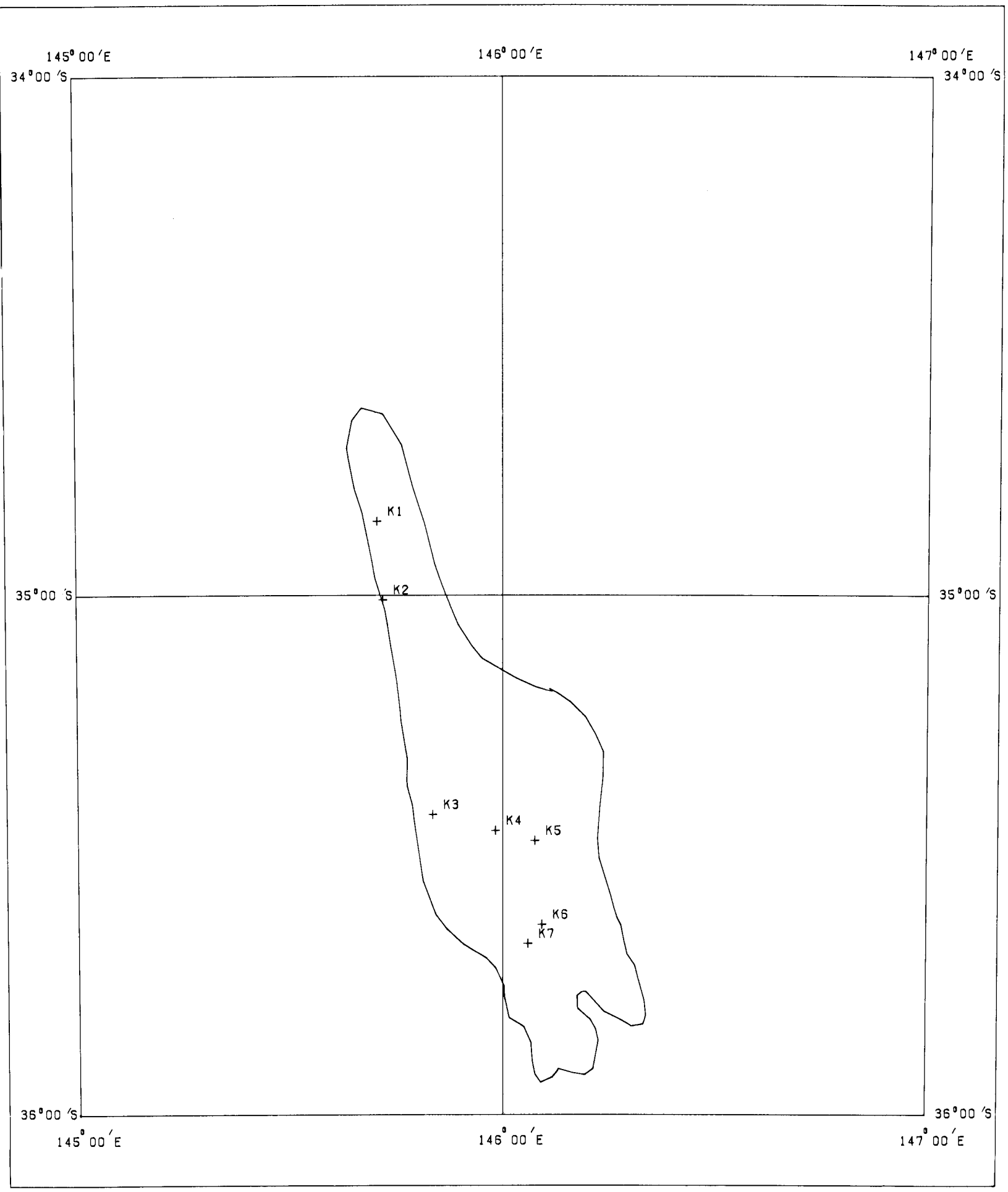
WITH STANDARD PARALLELS -31° 00′ AND -35° 00′

PLATE 39

CONTROL POINT DISTRIBUTION

15/A/200-15

OAKLANDS BASIN



SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

WITH STANDARD PARALLELS -34° 20′ AND -35° 40′

PLATE 40

CONTROL POINT DISTRIBUTION

15/A/200-16

COOPER BASIN

SCALE 1: 1000000

PLOTTED WED., 11 MAY , 1983

SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

WITH STANDARD PARALLELS -24° 00′ AND -29° 00′

PLATE 41

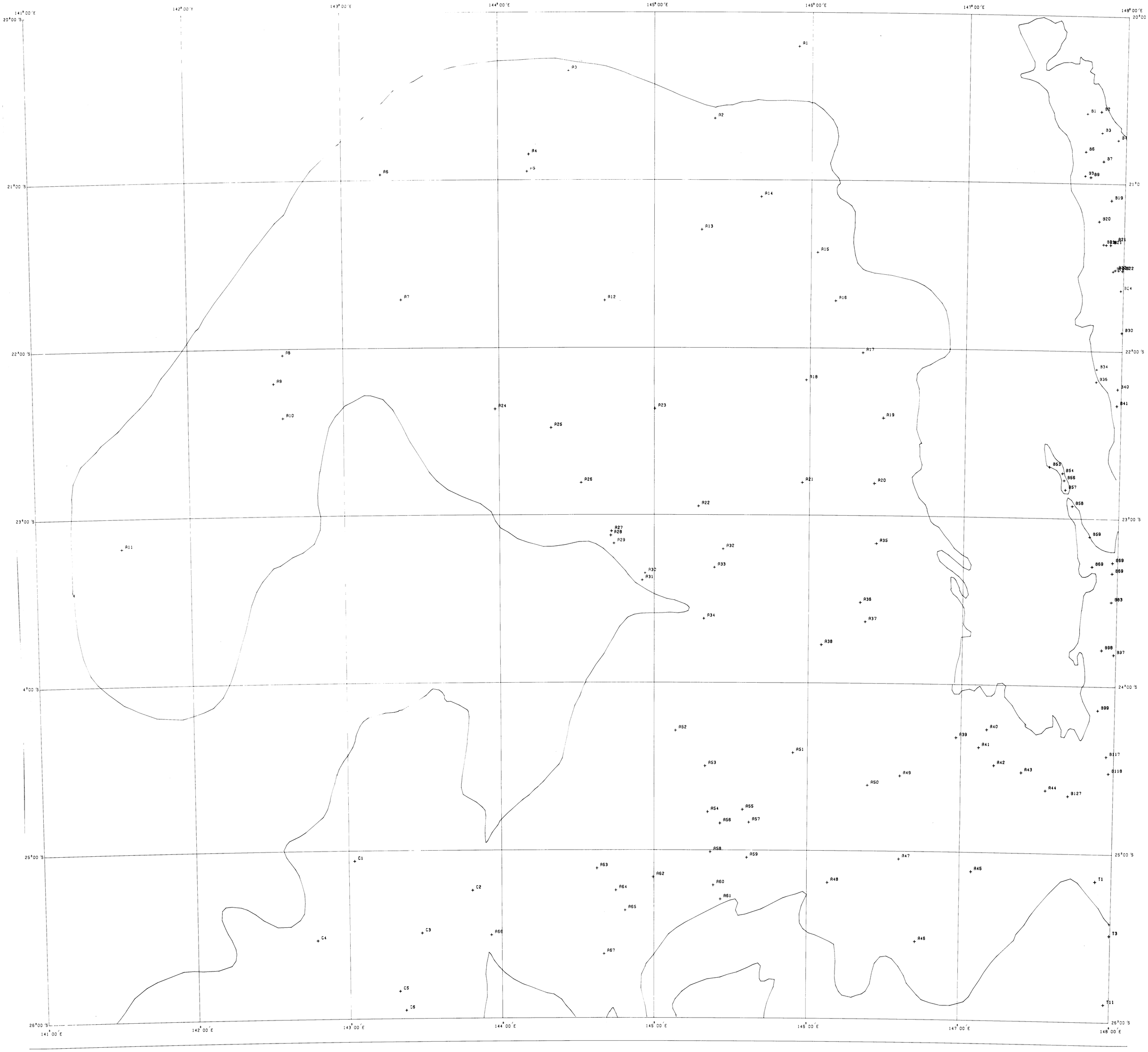
CONTROL POINT DISTRIBUTION

15/A/200-17

GALILEE BASIN

SCALE 1: 1000000

PLOTTED WED., 11 MAY, 1983



SCALE 1: 1000000

0 20 40 60 80 100 120 KILOMETERS

SIMPLE CONIC PROJECTION

WITH STANDARD PARALLELS -21° 00′ AND -25° 00′

PLATE 42

CONTROL POINT DISTRIBUTION

15/A/200-18