Interim report on the geology and coal resources of the northeast coalfields of Tasmania

by

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ABSTRACT

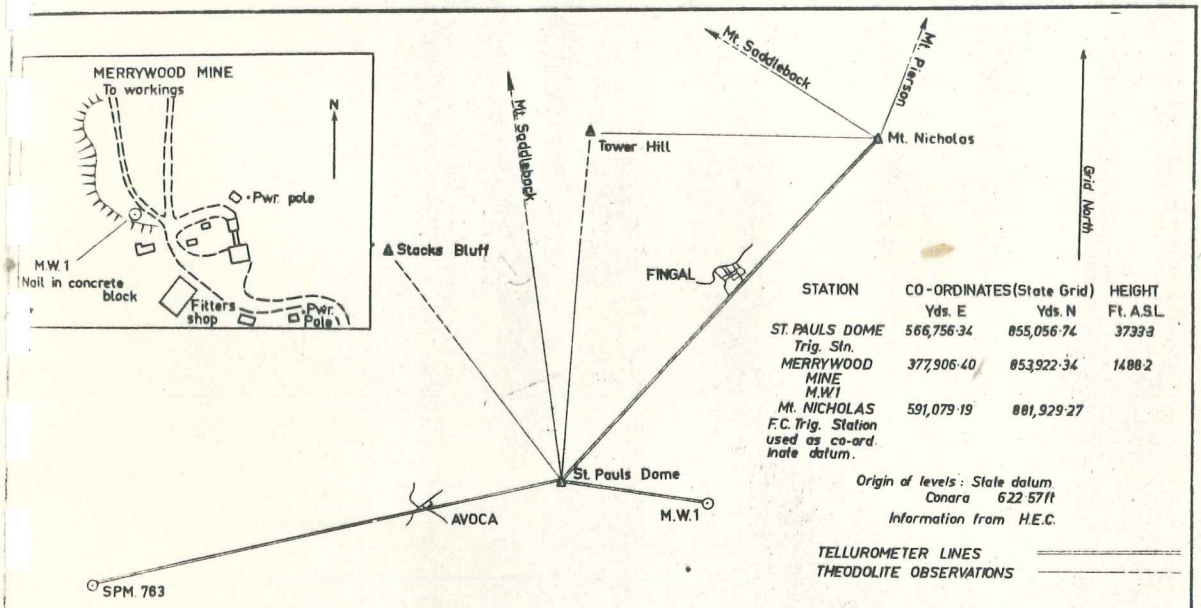
An area of approximately 300 square miles embracing the coalfields of northeastern Tasmania has been geologically mapped and a selected area in the Fingal district has been diamond drilled.

One thousand feet of Triassic sediments have been proved by diamond drilling and one hole (D.M. No. 6) has been logged by radio-activity and electric methods.

Cyclicity of the Triassic sediments is suggested and it is recommended that the techniques be reapplied to succeeding holes in order to arrive at a better understanding of the sedimentary succession.

Diamond drilling and mapping of coal workings is still proceeding and no revised estimate of core resources is yet warranted.

The records of all drilling and coal assays, etc., are appended.



STATION	CO-ORDINATES (State Grid) Yds. E	Yds. N	HEIGHT Ft. A.S.L.
ST. PAULS DOME Trig. Stn.	566,756·34	855,056·74	3733·3
MERRYWOOD MINE M.W.1	377,906·40	853,922·34	1488·2
Mt. NICHOLAS F.C. Trig. Station used as co-ordinate datum.	591,079·19	881,929·27	

Origin of levels: State datum
Conara 622·57 ft
Information from H.E.C.

TELLUROMETER LINES
THEODOLITE OBSERVATIONS

FINGAL VALLEY COAL RESOURCES SURVEY

0 4 8 MILES

3171 – 48

Fig 1

INTRODUCTION

This report sets out the results of an investigation into the coal mining potential of the South Esk Valley and neighbouring areas (see locality map inset on Fig. 3). It consists of a geological map and report, the results of diamond drilling, a compilation of all relevant existing data and discussion of results and future work to be undertaken and of favourable areas for further diamond drilling.

The base map has been prepared from air photographs by the Mines Department drawing office using a tellurometer and theodolite survey by the H.E.C. for ground control (figure 1). The positions of all boreholes and mine workings were fixed by closed theodolite and level traverse by Department of Mines Survey, B. Knox and assistant B. Eaves.

The area covered by the geological map is approximately 200 square miles, made up as follows:-

1. South Esk and St Pauls Valleys mapped by the writer directly on to air photographs and transferred to the base map. Acknowledgement is made to F. Blake for preliminary mapping in the Snow Hill quadrangle part of which was utilised to cover the area south of St Pauls River, and to H.G.W. Keid for preliminary mapping in the valley between St Marys and Fingal.
2. North of Avoca, mapped by A.H. Blissett – The geology of the Rossarden-Storeys Creek district (Bulletin No. 46 Department of Mines Tasmania, 1959)
3. North of Fingal mapped by the writer – The Mangana-Waterhouse goldfields (Thesis Geol. Dep. Univ. Tas. Unpubl. 1966)
4. Southeast of St Marys mapped by R.D. McNeil – The geology of the Mt Elephant, Piccaninny Point area (Pap. Proc. Roy. Soc. Tas. Vol. 199. 1965).
5. East coast coalfields mapped by H.G.W. Keid in The coal resources of Tasmania (Mineral Resources of Tasmania No. 7 Dept. Mines Tas. 1922)

With the exception of the boreholes and mine workings, all elevations used in preparation of the geological cross sections were determined by aneroid barometer.

Annual rainfall in the area ranges from 26 inches at Avoca and 23 inches at Bicheno to 39 inches at St Marys and considerably more on the dolerite plateau which is mostly above 2000 feet A.S.L. Clearing and cultivation is restricted to the valleys of the South Esk, Break O'Day and St Pauls Rivers, and to the coastal plain. The coal mining area is principally on the flanks of the dolorite plateau except in the Seymour-Bicheno area where coal was mined at and below sea level.

HISTORY OF COAL MINING IN TASMANIA

The first recorded discovery of coal in the state was in the South East Cape area by a party of French explorers in 1793. The second and more significant discovery was in 1803-4 on the banks of Coal River at Pittwater.

Coal mining in Tasmania dates from 1834 when seams in the Tasman Peninsula were worked with convict labour. Coal mining in the Fingal-St Marys area began when the Conara (Cornara) to St Marys railway was opened up in 1886. Although this field was late in commencing coal production it has furnished the bulk of the state's output, 7,814,060 tons out of a total of 9,409,458 tons, up to the end of 1966.

ACKNOWLEDGEMENTS

The author wishes to thank Mr. W. Tindall, Inspector of Mines of this Department for information given in relation to coal mining in Fingal and neighbouring areas, and to Mr. M.R. Banks, Senior Reader in Geology at the University of Tasmania for identification of fossils. Appreciation is also expressed to Mr. I.B. Jennings, Chief Geologist, and Mr. A.J. Noldart, Senior Geologist (Economic Section), Department of Mines for criticism of the manuscript and helpful advice.

GENERAL GEOLOGY

Mathinna Beds

Lower Palaeozoic sediments consisting of slate and phyllite with interbedded siltstone layers and overlain by an interbedded sequence of sandstone and mudstone, known collectively as the Mathinna Beds, form the bedrock of the area. They are folded on NNE-30° axes and are intruded by Middle-Upper Devonian granitic rocks. The Mathinna Beds were peneplained in Upper Palaeozoic times and are unconformably overlain by Permian beds. The Mathinna Beds outcrop in the South Esk and St Pauls valleys and on the E coast but do not occur in the Break O'Day Valley except near the South Esk-Break O'Day confluence and E of the Cornwall fault.

Permian Systems

Detailed sections of the Permian succession have been compiled by Walker (1957) at Rays Hill No of St Marys, Banks (1953) St Pauls Dome, Blissett (1959) Rossarden-Storeys Creek, and McNeil (1965) Mt Elephant. A summary of these sections is given in the accompanying table together with sections deduced from the 1890 drilling at Harefield and Killymoon and the thickness of the Ferntree formation penetrated in Department of Mines D.M. No. 4. There are no complete sections in the Fingal area and composite sections would not be very useful as the various members of the succession are of variable thickness. There is a suggestion of a thinning of Permian Beds No of the Break O'Day River in Walker's section at the eastern end of the area mapped and also in the area NE of the South Esk – Break O'Day confluence.

In general, in this area, the section commences with a basal conglomerate approximately 20 feet thick and is followed by freshwater sediments correlated with the Mersey Group of North Western Tasmania. There are no equivalents of the Quamby or Golden Valley Group beds in the area. In the Rossarden-Storeys Creek section, Blissett distinguished between basal beds developed on granitic rocks and those developed on Mathinna beds.

Section

Member	Mt Elephant	Rays Hill	Harefield	Killymoon	D.M. B.H.4	St Pauls Dome	Rossarden
Ferntree (exl. Risdon)	90	70	91	80	181	95	200+
(Risdon)	3-60	Nil	(12)	(4)	(19)	(20)	(40)
Cascades	140 115	60 120	146 10	133 85		148 67	10 120
Mersey	100	90 Rays Hill arkose	129	126		61	150 Aberfoyle formation
Coal Conglomerate	22	Nil	27	32		15	
Coal	420+	340	415	460		406	520

The former is a granite derived arkose whereas the latter is a fresh water sediment typical of Mersey Group sandstone. Both types of sandstone are present in this Aberfoyle formation. Walker also noted arkosic sediments on granitic rocks at the base of the succession at Ray's Hill. In parts of the St Pauls Valley there are only 20 feet of pebbly sandstone between Triassic beds and granite, this may be due to non-deposition caused by topographic high points in the pre-Permian topography or erosion following the Permian sedimentation. The next member in the succession is the Cascades Group, consisting of mudstone and overlying limestone. This is overlain by the Ferntree Group with the Risdon sandstone at the base. The Malbina Formation and Grange Mudstone of the Cascades Group have not been registered in this area. In D.M. B.H. 4 the base of the Risdon Sandstone and the top few inches of the underlying limestone were glauconitic. This borehole penetrated 181 feet of Ferntree Group beds. These sediments were a dark grey siltstone with scattered ⅛ to ¼ in quartz grains. No glacial erratics were encountered in the borehole but the flanks of the Break O'Day Valley are strewn with pebbles of rounded quartzite and schist presumably of glacial origin as these rock types are foreign to the district. The range in size up to 6 ins. And occur most plentifully at the base of the slope below the Permian/Triassic contact on either side of the valley.

The Triassic System

Hills et al. (1922) proposed the following subdivision of Triassic sediments in the Nicholas coalfield.

Upper Sandstone	200 ft. +
Feldspathic Sandstone	400-800 ft.
Ross Sandstone	200-1350 ft.
Basal Grits	1-50 ft.

In this he closely followed a section by Nye (1921) but the Upper Sandstone member is not now recognised and Ross Sandstone is considerably thinner than the thickness proposed while in many sections basal grits are absent. Hills and Carey (1949) proposed two new subdivisions for the lower portion of the Feldspathic Sandstone. The Newtown Coal Measures and the underlying Knocklofty Sandstone and Shale. Banks (1952) and Jennings (1955) reincorporated the Coal Measures in the Feldspathic Sandstone member.

The thickest Triassic section so far described is that by McKellar (1957) for portion of the Western Tiers. The thickest Triassic section so far recorded in the area under review is that in D.M. B.H. 6 which passed through dolerite outcrop into Triassic beds at 425 feet and into Permian beds at 1,480 feet, giving a total of 1,055 feet. The Fingal section is given below with the McKellar and Jennings sections for comparison.

	Feet		Feet		Feet
Brady Formation Sandstone, Siltstone, Shale and coal seams	540	Feldspathic Sandstone including the Newtown Coal Measures	260-360	Feldspathic Sandstone including coal measures	660
Tiera Formation Thinly bedded sandstone, siltstone and shale, with plant resins but no coal seams	280	Knocklofty Sandstone and shale with plant remains but no coal seams	500	Mudstone, carbonaceous mudstone, coal seams and subordinate sandstone	120
Cluan Formation Predominantly sandstone at base to predominantly shale at top	460			Sandstone, mudstone and laminated mudstone	200
Ross Sandstone massive sandstone	650	Ross Sandstone	300	Ross sandstone normally becoming coarse towards base but occasionally gradational into Permian	13-75
	1930	(Max.)	1160		1055

There are considerable differences in thickness and lithology between corresponding members in these sections which preclude correlation, but as the end members of these sections appear to match, it is probable that the implied correlation of the remainder of the sections is correct. Although the Fingal section is the smallest of these, there is evidence that it encompasses the complete Triassic period as Jurassic plant zones have been recognised in specimens from Mt Nicholas (Hale, 1962) Ibid. and in two boreholes D.M. Nos. 4 and 6, the Triassic beds are conformable with the apparently complete Permian.

….(Previous page/s missing)…correlations of beds within the Triassic System. Smith (1957) stated that the formation names: Feldspathic Sandstone and Newtown Coal Measures were unacceptable under the Australian Code of Stratigraphic Nomenclature. Hale recommends that the use of those terms and Knocklofty Sandstone and Shale be discontinued and that in all new sections formations be given local names.

The term feldspathic sandstone has come, by loose usage to be used as a rock type for the salt and pepper type sandstone of the coal measures. This term was used for convenience in the bore logs accompanying this report but several sandstone specimens from B.H. 6 have been described by Everard and identified as lithic sandstone and sub-greywacke. Other rock types identified by Everard were: limestone from the coal measures and quartz sandstone

from near the base of the Triassic succession. The descriptions are given in full in Appendix 6.

Cainozoic Sediments

Fluviatile sediments of unknown thickness occupy the valleys of the South Esk River and its tributaries. These sediments occur both under the basalt of probably Pliocene age (Edwards, 1938) and above it and, therefore, both Tertiary and Recent sediments are present. A borehole drilled in the bed of the South Esk River at Tullochgorum failed to reach bedrock and stopped at 270 feet still in alluvium (Krause, 1890).

The coastal plain on the east coast has only a few feet of weathered rock and soil over bedrock. This surface is, therefore, a plain of degradation and probably owes its origin to the effects of Marine erosion.

Dolerite scree is widespread along the slopes of the dolerite masses. The following thicknesses have been recorded from boreholes in the area.

H.E.C.	C1	300 ft.
	C8	205
	C9	125
D.H.	1	89
	2	198
	3	290

Scree particles range in size from clay derived from weathered dolerite to boulders of 15 feet in diameter. This mantle of dolerite scree on the slopes and “rock streams” in the intervening gullies masks the dolerite/Triassic contact and much of the outcrop of the sediments below the contact. This causes considerable difficulty in determining the form of the dolerite intrusions and in locating coal outcrop.

Igneous Rocks

1) Devonian Granite
   Devonian granitic rocks occur in the St Pauls Valley and in the St Marys-Bicheno areas on the east coast. These rocks were not studied in this project.
2) Jurassic Dolerite
   This occurs extensively in the area mapped as monadnocks such as St Pauls Dome, Avoca and St Patricks Head, St Marys; as a capping on the Nicholas Range; and as a plateau extending from the Fingal Tier in an almost unbroken sheet to the Tasman Peninsula in the south; as transgressive bodies extending down into the valleys from the plateau such as between Fingal and the Duncan Colliery and others further east projecting into the Break O’Day Valley and finally as numerous isolated occurrences in the valley floor many of which intrude Mathinna Beds and are probably separate dykes or pipes stemming from a larger body below.

The form of the dolerite intrusions is relevant to the estimation of coal reserves. There were no actual contacts seen between dolerite and sedimentary rocks but with regard to the main dolerite sheet the following relationships were inferred: At St Pauls Dome near Avoca the dolerite in contact with lower Triassic beds and proceeding eastwards towards Fingal the contact remains at this stratigraphic level of lower. Coal outcrops have been reported from the headwaters of Tullochgorum Creek but this is not confirmed by the writer. Decomposed feldspathic sandstone fragments were found in the area, but coal if present, is probably one of the many, uneconomic, thin seams which occur in the Triassic succession down to within 100 feet of the Permian contact. Beyond Fingal the dolerite is in contact with Triassic beds above the economic coal horizons. This relationship also occurs on the Mt Nicholas Range where the range consists of four separate outcrops. The two westernmost and smallest outcrops of dolerite are in contact with lower Triassic beds and the two easternmost outcrops are in contact with upper Triassic beds, these comprise the Silkstone, Mt Nicholas and Cornwall Coal Mines. This condition also appertains in the area from St Marys to Bicheno and from Bicheno to Merrywood near Royal George on the St Pauls River.

The main dolerite sheet, therefore, shelves to the west with respect to the Triassic beds. The sheet also has a dip to the southeast roughly conformable with the sediments. There are several transgressive bodies of dolerite which are probably dykes stemming from the main mass and protruding into the Break O'Day Valley.

The numerous isolated dolerite outcrops which occur on the flanks of the amin slopes and in the valley floor have not been recorded from any of the boreholes drilled in this area. Their relationship to the main dolerite mass is not known; the interpretation given in the accompanying cross sections is that they are part of the main mass. This suggestion, if correct, would indicate that the South Esk – Break O'Day lineament is a dolerite feeder but in the absence of further evidence this is conjectural.

Tertiary Basalt

Basalt occurs at Germantown and Irishtown north of St Marys; at the western approach to St Marys and extending one and a half miles north; at Sheoak Hill northeast of Mt Nicholas and in the Avoca-Royal George area. Basalt occurs as valley infillings, hill top residuals and in one locality as a dyke. These occurrences will form the subject of a separate report and are not further discussed here. They do not occur in the coal bearing areas.

GEOLOGICAL STRUCTURE

The Permian sediments rest unconformably on the Mathinna Beds. The pre-Permian (pre-Mersey Group in this area as Wynyard Tillite, Quamby and Golden Valley Groups sediments are absent) surface appears to be nearly planar and to dip at 1° or less to the south. This

was determined on the exhumed erosion surface between Ringarooma and Fingal where Mathinna Beds are exposed. There is greater irregularity of the old surface in granitic areas.

The Permian-Triassic contact is, in this area, mainly disconformable and the two Systems are separated by a conglomerate of a few inches in thickness which grades upwards into the lowermost member of the Triassic System, a clean creamy quartz sandstone.

The dip of the Triassic beds has been determined by level traverses carried out by B. Knox in two collieries. The results obtained were: Valley Mine – dip 2° in direction 120°N and Yates Mine – dip 1½° in direction 098°N. Local variation is considerable and dips of 10° to 15° have been observed in some areas. A compromise between these two figures has been employed in the construction of the cross sections.

…(Beginning of sentence cut off top of page)…using the H.E.C. tellurometer survey and the surveyed borehole positions as check points. The difficulty of estimating fault movements by this means is that very slight variations of dip over the projected distances could cause apparent displacements of several hundreds of feet. For this reason 9 sections were constructed to allow cross checks on the interpretation. In figure 2 the fault pattern for the area, together with those deduced by Blissett (1959) and McNeil (1965) are shown in relation to the main coal mining areas.

The area is bounded on the W by the Castle Carey Fault which has a minimum displacement of 1400 feet down on the W side. The New Stanhope colliery is working a small segment of Triassic coal in the down-faulted block but is encountering very broken ground and abnormally steep dips probably due to its proximity to this fault. The eastern boundary is the Cornwall fault with variable displacement of approximately 500 feet down on the west side.

Several other large faults have been recognised by various workers; McNeil considered that the Cornwall fault lay to the west of Dalmayne and not to the East as originally shown by Keid. McNeill showed a second fault, the Lagoons fault, as following the coast down to Bicheno. The Douglas River fault and Silkstone fault are omitted in figure 2, both appear on Keids 1922 map but both are based on dubious coal seam correlations and neither appear necessary in the cross sections. The location of the Killymoon borehole, drilled in 1878, is shown on the geological map, figure 3, and is one and a half miles NE of the position shown on Keid's map. This is based on personal recollection by the owner of the Killymoon property and confirmed by the finding of scattered pieces of drill core in the vicinity. If there is a 200 feet fault lying between the Silkstone and Mt Nicholas collieries it must therefore lie at least one and a half miles further to the NE on the southern side of the valley. The presence of Permian sediments in the Break O'Day Valley as far east as the Cornwall turnoff places the fault even further to the east. Such a fault would probably have no relationship with the one plotted by Keid.

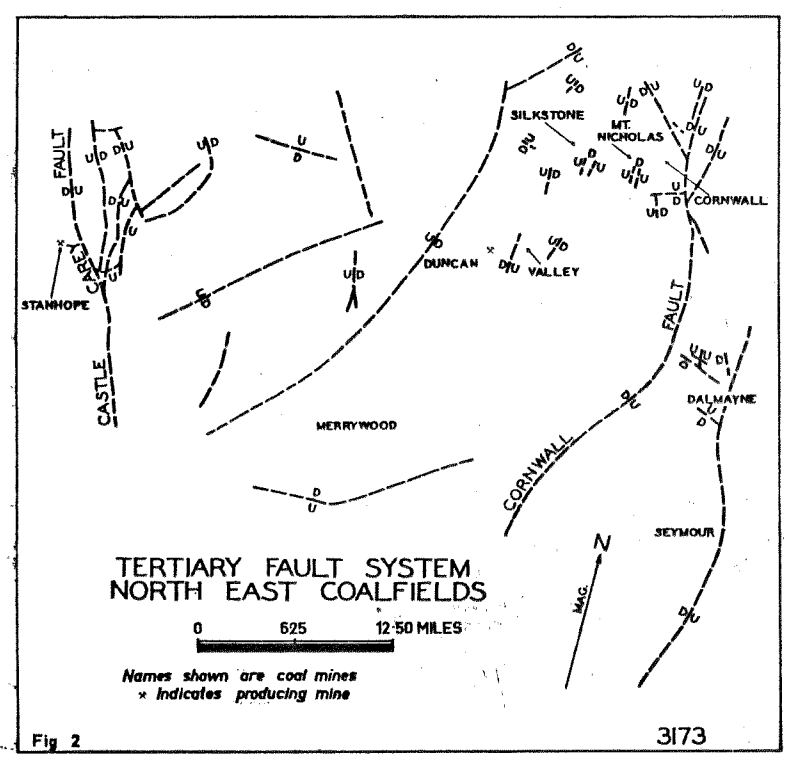
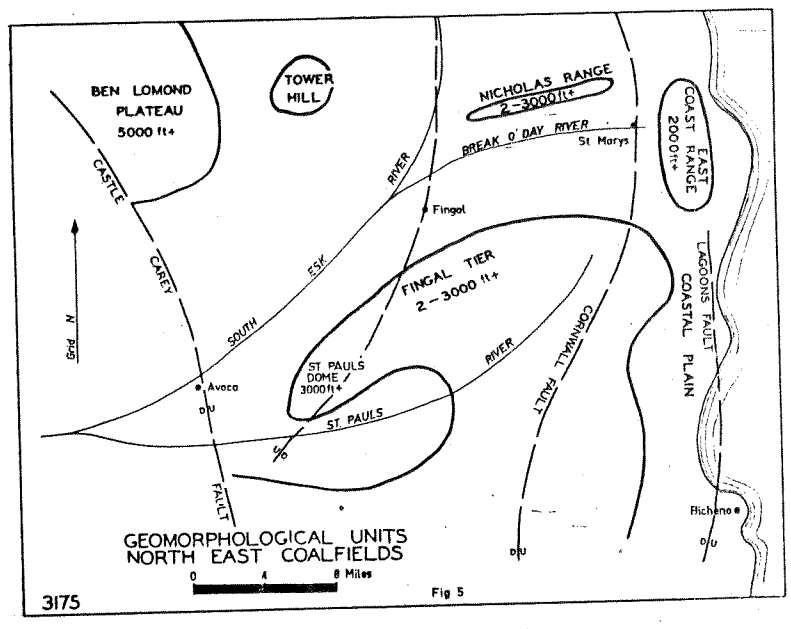

FAULT
STANHOPE
CASTLE
SILKSTONE
MT. NICHOLAS
CORNWALL
DUNCAN
VALLEY
FAULT
DALMAYNE
MERRYWOOD
CORNWALL
SEYMOUR
MAG.
N
TERTIARY FAULT SYSTEM
NORTH EAST COALFIELDS
0 625 12·50 MILES
Names shown are coal mines
* Indicates producing mine

Fig 2

3173


BEN LOMOND PLATEAU 5000 ft+
TOWER HILL
NICHOLAS RANGE 2-3000 ft+
COAST EAST RANGE 2000 ft+
BREAK O' DAY RIVER
St Marys
Fingal
CASTLE
CAREY
SOUTH
ESK
RIVER
FINGAL TIER 2-3000 ft+
ST PAULS DOME 3000 ft+
Avoca
ST PAULS
RIVER
CORNWALL FAULT
LAGOONS FAULT
COASTAL PLAIN
FAULT
Flicheno
D/U
GRID N
GEOMORPHOLOGICAL UNITS
NORTH EAST COALFIELDS
0 4 8 Miles
3175
Fig 5

Sections across the South Esk River between Fingal and Avoca indicate from 300 to 500 feet displacement (south side down). This could be due to Tertiary fault movement on the South Esk lineament but this presupposes a constant dip of Permian beds across the valley which is, in places, 2 miles wide. There is no evidence for faulting of any magnitude between the coal fields on either side, of the Break O'Day Valley.

The form of the dolerite intrusions has already been discussed in this report. The main mass has been interpreted as a roughly concordant sheet with some significant transgressions but with no major intrusions of dolorite into Triassic sediments resulting in dilatation faults.

GEOMORPHOLOGY

The geomorphological units are:

1. Dolerite plateau and monadnocks.
2. The East Coast Range
3. South Esk Valley and tributaries
4. Coastal plain

The topography is dominated by the Ben Lomond Plateau, Tower Hill, Nicholas Range, fingal Tier and St Pauls Dome which are all dolerite plateau or monadnocks and the East Coast Range which is composed of granitic rocks. The structural positions of the Ben Lomond Plateau and St Pauls Dome appear to have been determined by the Castle Carey Fault and that of the East Coast Range by the Cornwall Fault. At present it is not known whether the prominence of these masses is the direct effect of faulting or of differential erosion along a fault line scarp.

The South Esk Valley north of Fingal lies along a Tertiary fault (figures 3 and 5), between Avoca and Fingal a northeast striking lineament has probably determined the line of the valley. This has been suggested as an ancient structure (Threader 1966) and there is evidence for Tertiary Monvement on this line also (figure 4.) The Break O'Day Valley may now occupy an older South Esk River Valley during a period when it flowed eastwards. This is suggested by the widening of the alluvial plain in an easterly direction.

The Coastal Plain lying south of the East Coast Range and east of the dolerite plateau, being devoid of superficial deposits, is probably of marine erosion origin.

THE COAL SEAMS

Bituminous coal in Tasmania occurs at three levels:

1. Mersey Group sediments of Permian age – correlated with the Greta coal measures of N.S.W. (Lower Coal Measures). (Banks 1962, p. 205)
2. Cygnet Coal Measures of Upper Permian age correlated with the Tomago coal measures of N.S.W. (Upper Coal Measures). (Banks 1962, p. 211)

3. Triassic coal measures associated with feldspathic sandstone, which are probably correlated with the Nymboida coal seams of N.S.W. and the Ipswich stage of Southern Queensland.

Coals of types 1 and 2 are not known in the area studied but traces of them were found in the Killymoon and Harefield bore cores. Tasmanian Triassic coals are all non-coking bituminous coals with a high ash content and an average calorific value of 10,000 BTU/lb. They are principally used as domestic fuel and for steam raising. Some analyses of coal from the principal workings in the district are given in Appendix 1.

Eight Triassic coal seams were identified by Hills (1922) and named: Alpha, Beta, Gamma, Delta, Eta, Theta, Iota and Kappa. He stated that they were associated with a zone occupying about the middle of the Feldspathic sandstone. The Delta or main seam was stated to have a sandstone reef end to be separated from the underlying Eta seams by 10-30 feet of shale. Using this as a datum he identified the remaining seams in the sequence.

Hills (1922) states that the main coal seam in the Nicholas Range, Fingal, Dalmayne, Seymour and Douglas River coalfields is the Delta seam and the main seam worked in the Mt Christie and Merrywood areas is the Beta seam.

The character of individual seams is variable over quite short distances and consequently correlations based on seam characteristics are invalid. In this report, therefore, all coal seams are referred to using local names.

The composite section figure 7, shows how variable is the Duncan seam which is barely recognisable in bore core east of D.M. 5 and the East Fingal seam is barely recognisable west of D.M. 5.

The two seams with intervening shale appears to be a reliable marker over most of the area and has been recorded from the Mt Nicholas and Cornwall Mines and was intersected in the 2 Cornwall boreholes. In the vicinity of both the Valley and Duncan collieries there are adits at an elevation of approximately 40-50 feet below the main workings and a borehole from the floor of Yates adit intersected a poor coal seam 54 feet below the Duncan seam. It appears, therefore, that the two seams are present on the south side of the valley but are further apart than they are on the north side.

A proximate analysis of the lower seam at the Valley mine is given in (Appendix 1 Assay no. 3027). At the Cornwall Coal Mine there are three seams. The main seam is the Hitit (4'9") with the Fenton (8') approximately 100 feet below it and the Blue (11') approximately 30-40 feet above it. These three seams are present in the Cornwall surfaces bore holes (Appendix 1). The groups of coal seams and interbedded mudstones approximately 270-300 feet above the Hitit seam in those boreholes may correspond to Hill's Beta seam.

At Duncan and Yates Mines the main seam is correlated with the Hitit, and is 7 feet thick. It is present in D.M. 2-3 and 6, and splits into 2 seams in D.H. B.H. 5, an upper 3 feet and a lower 6 feet with 8 feet of mudstone between them. Further E these seams deteriorate into a mudstone-coal sequence. It appears that for at least a mile and a half east of B.H. 5, this seam is unworkable but the presence of a 13-16 feet seam at Dalmayne, a further 6 miles E and regarded as the Delta Seam by Keid, suggests that the seam improves in quality beyond the eastern limits of the drilled area.

Very little is known of seams below the Duncan seam on the southern side of the valley. Drilling by H.E.C. revealed a thick mudstone-coal sequence commencing at approximately 190 feet below the Valley seam. An assay of this material by the Joint Coal Board gave the following results: 7 feet 6 inches thickness, calorific value 9230 BTU/lb and ash content 29.5%. None of the intersections of this seam in the other H.E.C. boreholes were sampled but 4 samples from D.M. 5 at 519 and 619 gave even poorer results. This seam probably corresponds with the Fenton seam of the Nicholas Range.

Correlation of coal seams based on thickness, distance apart and nature of, roof and floor rock is invalid due to the variability of these factors. Palynological studies by Playford (1966) indicated a typical microfloral assemblage for Upper Triassic sediments (Appendix 2) and indicated that spore studies are unlikely to provide a useful correlative index. There is at present no satisfactory basis for the correlation of these coal seams as the individual seams have no special characteristics and there are no known marker horizons in the sedimentary succession. This fact is strongly suggestive of cyclic sedimentation. In such a series of rocks in which units are deposited in ABC or ABCD order, correlations are extremely difficult because different cyclic units are easily mistaken for each other.

CYCLIC SEDIMENTATION

In the Carboniferous coalfields of the Northern Hemisphere, coal seams are considered to have formed during a cycle of sedimentation which consists of freshwater shales, followed by sandstone and finally coal resting on a bed of fireclay (seat earth). This fireclay is usually interpreted as a fossil soil and the frequent occurrence of rooted plants embedded in it is taken as evidence for the in situ formation of coal.

The necessary environment for the accumulation of plant material to ultimately form coal is a body of stagnant water such as would be found on the outer edge of a coastal plain. During coal formation it is assumed that subsidence of the area is very slight and is just sufficient to balance the accumulation of material in the basin. If this balance is disturbed by increased subsidence, the area becomes flooded by the sea and the accumulation of coal-forming debris ceases. The cycle is completed by a marine series of limestone and shale. This is the classical cycolthem (a series of beds deposited during a sedimentary cycle) of the Appalachian coalfields of U.S.A. and the coalfields of U.K., etc. The transgression of wters over the basin may be marine or freshwater.

Cyclic sedimentation was also noted in the coalfields of peninsular India, but of different nature from the northern hemisphere type. These coal measures are of Permian age (Gondwana series) and consist of sandstone, shale, clay carbonaceous shale and coal in ascending order. Seat earths and traces of rooted vegetation are usually absent. A drift theory of origin was formulated to account for the formation of these coals (Fox 1931). The Permian coal measures of N.S.W. and the Tasmanian Triassic coals are similar to these coals in many respects. The absence of seat earth has been suggested (Duff 1967) as due to the deciduous nature of the vegetation. The seams formed on a layer of vegetable ooze and the lack of root evidence is thus explained. Duff also suggests that the immature nature of the detritus is evidence for cold climate conditions which may also account for the lack of weathering products to build up a soil. The type of cycle characteristics of these fields (a fining upwards) is explained by him as a product of an alluvial plain environment. This may account for the prevalence of dirt bands in most Australian coals. These indicate frequent flooding of the coal forming area, a more likely event in an alluvial plain environment than in a deltaic one.

The prevalence of clay pellet conglomerate bands in the sandstone overlying the coal seams is another point of difference between the northern and southern hemisphere coal fields. These bands are a type of intraformational conglomerate thought to be due to penecontemporaneous fragmentation and redeposition (Pettijohn 276-8). The debris from which they are made is considered to be of local origin and to have undergone little or no transportation. The fragmentation was probably effected by temporary withdrawal of water from the area followed by dessication and mud cracking. The pellet horizons may not all be of this origin and some disorientated ones were noted, these are shown in the composite borehole section as mudstone and sandstone fragments (poorly bedded) and some of these may owe their disrupted framework to the action of turbidity currents. On the whole these beds show a lateral persistence at least equal to that of the coal seams and were utilised for correlative purposes in drawing up the composite borehole section. The cyclic nature of the succession was first noted by the writer during logging of the Department of Mines drill core. Subsequent confirmation of this was obtained by bore logging (resistivity, self potential and gamma ray) carried out by M. Longman of this Department. In figure 8 the three logs are plotted alongside the core log. It can be seen that: (i) graded sequences are reflected in all logs, (ii) cyclicity is reflected in all logs with the resisitivity log giving the best results, (iii) the rock type “feldspathic sandstone” shows considerable variation in all logs and is probably made up of lithic sandstone and clean fine grained quartzose sandstone, although the possibility of other rock types as well is not precluded, (iv) the modal cycle is a sandstone fining upwards and passing into a siltstone and finally mudstone. A carbonaceous bed or coal seam is the end member of a cycle but not invariably as some of the earlier cycles are incomplete. The end of a complete cycle is marked by the top of a mudstone – coal sequence rather than a coal seam, in such cases the cycle may be the symmetrical unit (ABCB) rather than the asymmetrical unit (ABC). Some

reverse gradings (fining downwards) were observed which suggests that this may be so. Duff considers that asymmetrical cycles typify the alluvial plane environment and symmetric cycles typifies the deltaic environment.

Sedimentary Cycles in D.M. B.H. 6

Cycle	Depth ft.	Thickness ft.	End Member
16	481-542	61	6 ins. of black shale
15	542-615'3"	73	20 ft. of coal, carbonaceous mudstone, and clay
14	615'3"-721	106	2 ft. of black shale
13	721-809	88	6 ft. of coal & mudstone
12	809-855	46	6'0 3'6" seams 7'1 B m.s.
11	855-918'4"	63	2 ft. coal and 7 ft. mudstone
10	918'4-1000	82	2 ft. coal & 4 ft. mudstone/siltstone
9	1000-1043'9	44	10 ft. coal (Main seam)
8	1043'9-1102'11	69	4 ft. carbonaceous mudstone, siltstone & an 8 in. coal seam
7	1102'11"-1163	60	31 ft. sequence of banded mudstone and coal. Coal seams of 3 ins. & 5 ft. 0 in (East Fingal Seam)
6	1163-1200	37	1 ft. 4 ins. of coal and shale
5	1200-1220	20	4 ft. 6 ins. of carbonaceous mudstone, and coal
4	1220-1258'6	38	4 ft. of carbonaceous mudstone
3	1258'6"-1319	61	26 ft. of slightly carbonaceous mudstone
2	1319-1394	75	7 ft. of mudstone, carbonaceous at base
1	1394-1480	86	22 ft. of mudstone

These wholly freshwater sedimentary cycles succeed the Permian sedimentation during which cycles of alternating Marine and fresh water beds were deposited. The Mersey and Cygnet coal measures are probably end members of cycles of similar type to those of the northern hemisphere with the main difference being in the scale. These Australian cyclothems are of the order of hundreds of feet thick instead of the more usual tens of feet. The presence of spore beds in the Quamby Group may indicate another earlier cycle in the Tasmanian succession.

Wholly freshwater cycles occur within the N.S.W. Permian coal measures, these are comparable in size to the northern hemisphere cyclothem. Cycles within the Tasmanian Permian coal measures have been suggested by McKellar (1957 p.8)

EXPLORATION

Prior to the present programme, diamond drilling was carried out in the floor of the Break O'Day Valley. Two holes were drilled; the Killymoon and Harefield holes, in 1978 and the logs are appended to this report. Briefly the results were as follows: The Killymoon hole penetrated Permian beds and bottomed in Mathinna Beds. The Harefield hole drilled through 270 feet of Triassic beds before passing into Permian beds. Neither hole passed through any economic coal seams. Two holes were drilled by Cornwall Coal Company on their Cornwall property; these holes passed through 605 and 655 feet of Triassic beds with coal seams (see Appendix 7 for core logs and assay results). The same company recently drilled a short hole from the floor of Yates adit to test for underlying seams (see also Appendix 7).

In the current investigation 9 holes were drilled by the H.E.C. and 6 by the Department of Mines with a seventh being drilled at the time of writing. (Figure 6). The H.E.C. holes were all drilled east of Spion Kop and 4 (C1, C2, C3 and C8) passed through the expected main seam horizon without intersecting a workable seam. The remainder of the holes (C4, C5, C6, C7, C9) were drilled at a lower level to intersect the East Fingal seam. This seam has nowhere proved to be of sufficient quality to be considered workable. The Department of Mines holes 1, 2, 3 and 6 were drilled west of Spion Kop to the south of the Duncan colliery workings and all intersected the main seam but in hole No. 1 the seam was broken into 6 partings none of which was sufficiently large to constitute a workable seam. Numbers 4 and 5 were drilled east of Spion Kop and both indicate a breaking up of the main seam although in No. 5 the lower portion of the seam was of workable thickness (6 ft. 6 ins.). No. 7 currently being drilled is located in the headwaters of Fingal Rivulet approximately half a mile south of No. 6.

From the records of past mining and drilling results it is evident that the Hiti-Duncan seam is the only one of sufficient quality, thickness and persistence to merit further investigation. This seam, moreover, usually has a sandstone roof which holds up well during mining and thus allows cleaner and cheaper coal winning. In the area east of Spion Kop this seam lacks a sandstone roof and has split into two or more thin seams and thus is uneconomic. This is assumed to be a local effect for the seam is of workable size and quality at Dalmayne, it can be expected, therefore, to improve east of C1 (towards St Marys). There is a large dolerite mass covering most of this area, which is presumed to be a dyke and, therefore, further coal search would have to commence in the Harefield area where Triassic sediments again occur and where several coal outcrops have been reported.

West of Spion Kop in the vicinity of the Cornwall Coal Company lease most of the diamond drill holes have revealed satisfactory thicknesses of the main seam. Although B.H.D.M. 1 indicates that even here there are places where the seam is unworkable.

The area stretching to the south and covered by the dolerite sheet exceeds 11 miles by 10 miles (1000 s.m). The whole area is fringed by coal workings and is presumably coal bearing beneath the dolerite if the dolerite is a roughly concordant sheet. The dolerite may be as much as 1000 feet in thickness but much of the coal would be accessible from adits if diamond drilling indicated workable coal seams.

Finally, the Nicholas Range which has been productive over a distance of 6 miles merits further investigation. Coal mining has only been carried out from the south side of the range but a tunnel was put through the range at the Cornwall Mine and proved that the main seam was present on the northern slopes. Several coal outcrops are shown on Keid's map on the northern slopes and the Forestry Commission road through the Mt Nicholas gap has revealed a coal seam near the highest point. The geological map shows the areas already worked out and indicates suitable drilling sites to further investigate the coal bearing areas.

RECOMMENDATIONS

Diamond drilling is recommended in the three areas discussed in the preceding section via:-

1. The Forestry Commission, Mt Nicholas Road.
2. The Forestry Commission, Tullochgorum-Merrywood Road.
3. Harefield

Initially one hole in each of these localities is proposed with additional bores to be sited according to the results obtained.

These three holes are all estimated to pass through 5-700 feet of Triassic sediments. In the case of No. 2 there could be as much as 7-800 feet of dolerite overlying the Triassic. There should not be any scree at the sites 1 and 2 but some could be expected at site 3. These localities are shown in figure 3.

With regard to well logging, the results obtained in B.H. 6 were encouraging and the techniques should be applied to all future drill holes in an endeavour to establish a correlative index for succession.

CONCLUSION

Some attempts have previously been made to assess the coal reserves of this and other areas in the State (Appendix 3). It is felt that even with the additional information obtained by diamond drilling a revised estimate is not warranted. Much of the area drilled has proved to be devoid of economically workable coal seams for all but small operators. This

may well be true of the whole field and the future of the field may lie in the operation of a number of small coal mines rather than in a few large ones. This would substantially increase reserves as it would allow exploitation of some of the other coal seams in the succession as well as some of the areas too small to be opened up as major collieries.

Another factor making it difficult to access reserves is the ultimate uses of the coal and the distance it has to be transported which bear directly on ash tolerance. A local use for the product would allow a considerable increase in reserves over one based on the present practice of coal washing and rail transport.

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APPENDIX 1

Some coal assays extracted from the Coal Resources of Tasmania, Department of Mines Mneral Resources No. 7.

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Coal assays from collieries in the Cornwall and Fingal areas

CHARACTER, ANALYSES, AND HEAT VALUES OF COAL SAMPLES

Reg. No.	Name of Mine or Locality of Exposure	Moisture 105° C	Volatile matter	Fixed Carbon	Ash	Sulphur	Hydrogen	Carbon	Oxygen	Nitrogen	Calories	B. T. U.	Evap. Power	Spec. Grav.
319	Cardiff	3.20	28.98	48.90	18.92	0.56								
320	"	4. 30	27.08	51.42	17. 20	0.47								
322	"	3.88	26.70	50.51	18.91	0.60	4.46	55.03	19.77	1.23	5486	9874	10.20	1.37
323	Jubilee	5.00	22.18	50.51	22.31	0.40								
325	"	3.92	28.52	47.46	20.10	0.60	4.50	55.69	17.78	1.33	5363	9653	9.98	1.47
382	Cornwall	3.72	23.16	56.76	16.36	0.41								
383	"	3.00	24.80	55.75	16.45	0.38								
629	"	3.80	21.74	54.38	20.18	0.36	4.02	58.63	15.66	.15	5560	10,007	10.34	1.43
630	"	3.98	22.48	55.22	18.32	0.36								
384	Mt. Nicholas	4.40	27.78	46.01	21.81	0.44								
385	" "	4.20	26.64	45.96	23.20	0.40								
627	" "	4.54	27.52	50.04	17.90	0.45								
628	" "	4.88	26.82	47.68	20.62	0.48	4.46	50.59	22.75	1.10	5412	9742	10.07	1.52
387	Silkstone	4.90	23.38	51.44	20.28	0.33								
388	"	3.30	23.48	48.52	24.70	0.48								
492	Fingal	2.70	26.82	48.18	22.30	0.03								
493	"	2.40	16.10	48.29	23.21	0.37								
494	"	1.00	24.00	48.80	26.20	0.24	3.85	57.83	10.80	1.08	5068	9122	9.43	
495	"	2.54	26.36	42.00	29.10	0.41								
513	"	4.69	27.81	52.30	15.20	0.50								
411	Dalmayne	4.46	22.22	55.30	18.02	0.69								
412	"	3.56	21.14	54.76	20.54	0.41	4.17	52.50	21.47	0.91	5240	9431	9.74	1.6
413	"	4.81	20.47	50.53	24.19	0.41								
414	"	4.50	18.68	51.40	25.42	0.33								
415	"	5.10	18.52	49.04	27.34	0.34	3.94	49.06	18.42	0.90	5191	9243	9.55	
417	Douglas Riv.	3.40	24.08	42.22	30.30	0.48	4.11	49.49	14.56	1.06	4722	8500	8.79	1.4
418	" "	4.26	23.58	48.51	23.65	0.56	4.24	54.00	16.51	1.04	5314	9564	9.89	1.4
419	Denison Riv.	4.40	24.80	53.50	17.30	0.62	4.36	60.66	16.83	1.23	5707	10273	10.62	1.4
624	Seymour	3.14	22.91	50.55	23.40	0.56	4.33	47.84	22.74	1.13	5510	9919	10.25	
625	"	3.14	19.10	49.86	27.90	0.49								
626	"	3.14	26.40	54.34	16.12	0.59								
693	Merrywood	2.66	25.10	53.88	18.36	0.44	4.59	57.76	17.69	1.16	6052	10,893	11.26	1.4

COAL ANALYSES - CORNWALL COAL MINE

(Eastern Workings)

Thickness Ins.	Moist.	Volatiles	Fixed Carbon	Ash	S.	BTU/lb.	Description
10	4.0	33.3	50.2	12.5	0.20	10,060	Coal
6	3.6	-	-	70.9	-	-	Brown stone with 3" coal.
25½	3.3	26.4	51.3	19.0	0.38	10,590	Coal.
16½	3.1	-	-	58.6	-	-	2" coal & stone 2" coal 6" grey stone 4" coal 23" grey stone 27" coal
99½	3.4	25.2	49.1	22.3	0.46	10,060	2" stone with 4" coal 10½" coal

8' 1"

(Shale floor)

(Eastern Workings)

35	3.7	25.7	50.4	20.2	0.23	10,990	Coal with mudstone roof
113	3.8	-	-	61.2	-	-	2½" coal and shale 3" coal 3½" sandstone 2" coal ½" stone
42	3.9	26.2	50.5	19.4	0.36	10,480	

6' 6"

(Shale floor and mudstone roof)

(Eastern Section)

30	3.3	25.8	43.3	27.6	0.29	9,220	Coal
8	3.0	-	-	69.3	-	-	Coal and mudstone bands
10	3.4	25.2	39.4	32.0	0.35	8,570	1" coal Penny band (stone) 6" coal ½" stone 2½" coal
53	3.8	23.8	52.5	19.9	0.31	10,400	

8' 10"

(Mudstone floor and sandstone roof)

[illegible] Seam (Gully Section)

Ie	Thickness ins.	Volat.	Volatiles	Fixed Carbon	Ash	S.	B.T.U./lb	Description
	15	2.7	22.9	36.7	37.7	0.20	7,553	12" coal ½" stone 2½" coal
	67	2.9	26.7	47.0	23.4	0.28	9,941	14½" coal 3½" stone with 2½" coal bands 44" coal Mull coal
	6' 10"							

[illegible]itsan (Gully Section)

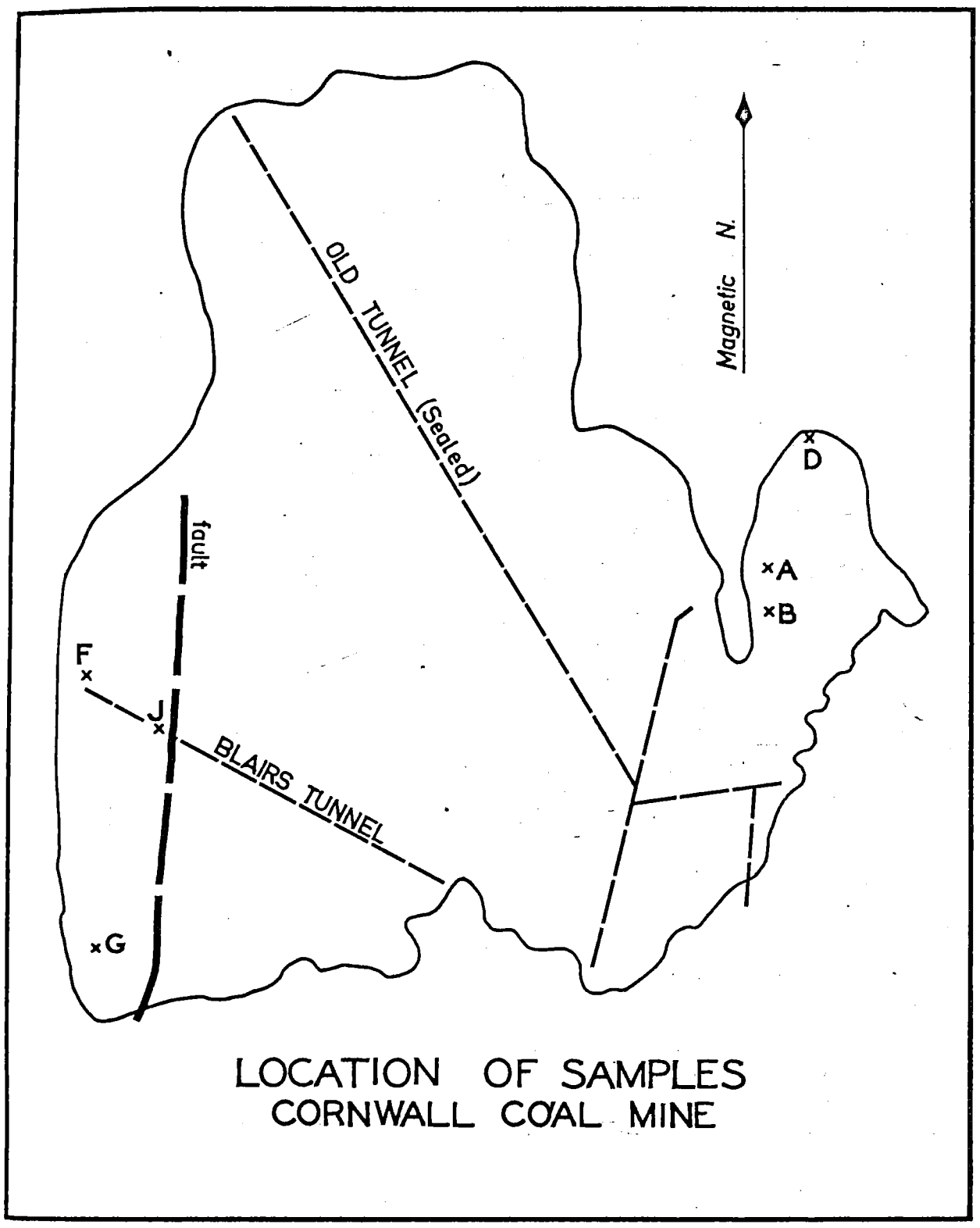
32	4.1	25.6	55.0	15.3	0.32	11,140	Coal
15½	3.5	22.6	38.4	35.5	0.28	8,100	12" coal 1" stone 2½" stony coal
70½	3.2	26.3	46.2	24.3	0.28	9,300	25½" coal 1" stone 12" coal 3" penny stone band 2½" coal ½" stone 22½" coal 6" stony coal
9' 10"							

(Mudstone floor and a 1" stone band on roof separating the Hitit Seam from Sample H1.)

Above Hitit (possibly coalit off it) Gully Section

46	4.2	26.6	48.9	20.3	0.33	10,430	Coal
18	3.8	-	-	70.0	-	-	Stone with a few coal bands
20	3.7	31.3	51.4	13.8	0.33	11,430	16" coal ½" stone 3½" coal 3" brown shale not sampled.
21	4.1	25.4	52.4	18.1	0.24	10,790	7" coal ½" stone band 13½" coal
8' 9"							

(Mudstone roof and floor)



LOCATION OF SAMPLES
CORNWALL COAL MINE

3176—49

Proximate Analyses of 50lb. channel samples from Coal workings.

Assay No.	Locality	Moisture	Volatile	F.C.	Ash	S	BTU/lb.
3027	Valley Mine minor seam 50ft. below main seam	4.28	18.7	33.42	43.6	-	-
	Valley mine main seam (near portal)	4.37	23.9	50.13	21.6	0.21	10,116
	Valley mine main seam (near face)	4.27	23.5	51.13	21.1	0.24	10,039
	Yates Colliery (main seam)	4.38	23.7	49.62	22.3	0.30	10,070

APPENDIX 2

Palynological Report on some Triassic coal seams by Mary Playford. Samples collected by Department of Mines, Tasmania

MATERIAL

The samples examined comprised roof, seam, and floor of the following coal seams:

Duncan Mine

Cornwall Mine, Blue Seam

Cornwall Mine, Mitit Seam

Valley Mine

Jubilee Mine

Mt. Nicholas, 6' Seam

Mt. Nicholas, 4'9" Seam

Mt. Nicholas, 8' Seam

METHOD

Plant microfossils were extracted from the samples by means of conventional maceration procedures. These entailed removal of mineralogical material with boiling 50-60% hydrofluoric acid and of resultant insoluble fluorides with warm dilute hydrochloric acid. The residues were then treated with Schulze solution (for between 10 minutes and 5 hours, depending on the particular sample); and subsequently with a very weak (less than 0.25%) solution of ammonium hydroxide. Some of the ultimate residues were subjected to a brief (5 seconds) treatment in a bath-type ultrasonic disintegrator; this disaggregated clumps of fine mineralogical and carbonaceous matter that tended to obscure the spores and pollen grains. All residues were finally mounted as straw slides in glycerine jelly.

In general, the samples did not yield either prolific or well-preserved assemblages of spores and pollen grains. Floor horizons of the seams were usually the most satisfactory and most of the palynological information derives from these. The actual coals provided disappointing results despite repeated attempts in their laboratory preparation using varying procedures. Only two of the coals yielded any plant microfossils at all, and the preservation of these was extremely poor, thus

precluding accurate identification.

[illegible]

Species of spores and pollen grains recognized in each of the coal beds are listed below:

Lucas Mine (floor)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Annulispora microannulata de Jersey

Aratrisporites bankai Playford

Aratrisporites parvispinosus Leschik

Aratrisporites sp.

Microfossorites sp.

Sirculina sp.

Sirculisporites parvus de Jersey

Cyanozonites nitidus (Balme)

Dictyophyllidites mortoni (de Jersey)

Microsporites verrucosus de Jersey

Cuthelisporites cancellosus Playford and Dettmann

Laevigatosporites sp.

Osmundacidites parvus de Jersey

Osmundacidites wellmanii Couper

Platysaccus queenslandi de Jersey

Staplinisporites caminusporites (Wilson and Webster)

Staplinisporites perforatus Leschik

Cornwall Mine, Blue Seam (floor sample)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Aratrisporites bankai Playford

Aratrisporites parvispinosus Leschik

Calamospora lucasa Playford

Sirculisporites parvus de Jersey

Converrucosisporites cymbatus (de Jersey)

Cycadopites nitidus (Balme)

Dictyophyllidites harrisii Couper

Dictyophyllidites mortoni (de Jersey)

Granulatisporites sp.

Laevigatosporites sp.

Neoraistrickia taylorii Playford and Dettman

Osmundacidites parvus de Jersey

Punctatisporites sp.

Stereisporites antiquasporites (Wilson and Webster)

Stereisporites perforatus Leschik

Cornwall Mine, Hitt Seam (roof sample)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Annulispora folliculosa (Rogalska)

Annulispora microannulata de Jersey

Aratrisporites parvispinosus Leschik

Chordasporites australiensis de Jersey

Circulisporites parvus de Jersey

Cycadopites nitidus (Balme)

Dictyophyllidites harrisii Couper

Dictyophyllidites mortoni (de Jersey)

Uvaesporites verrucosus de Jersey

Fuldaesporites sp.

Guthoerlisporites cancellosus Playford and Dettmann

Valley Mine (floor)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Annulispora folliculosa (Rogalska)

Annulispora microannulata de Jersey

Circulisporites parvus de Jersey

Concavisporites sp.

Cycadopites nitidus (Balme)

Dictyophyllidites harrisii Couper

Dictyophyllidites mortoni de Jersey

Guthoerlisporites cancellosus Playford and Dettman

Laevigatosporites sp.

Platysaccus queenslandi de Jersey

Punctatisporites sp.

Vitreisporites pallidus (Reissinger)

Jubilee Mine (floor sample)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Annulispora folliculosa (Rogalska)

Circulina sp.

Cycadopites nitidus (Balme)

Dictyophyllidites mortoni (de Jersey)

Osmundacidites parvus de Jersey

Osmundacidites wellmanii Couper

Platysaccus queenslandi de Jersey

St. Nicholas, 6' Seam (floor sample)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Apiculatisporis globosus (Leschik)

Apiculatisporis sp.

Calamospora sp.

Cycadopites nitidus (Balme)

Guthoerlisporites cancellosus Playford and Dettmann

Osmundacidites parvus de Jersey

Osmundacidites wellmanii Couper

Platysaccus queenslandi de Jersey

St. Nicholas, 4'9" Seam (roof and floor samples)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Annulispora folliculosa (Rogalska)

Annulispora sp.

Aratrisporites parvispinosus (Leschik)

Cycadopites nitidus (Balme)

Dictyophyllidites harrisii Couper

Dictyophyllidites mortoni (de Jersey)

Discisporites verrucosus de Jersey

Lundbladispora desmondi (de Jersey)

Lycopodiumsporites austroclavatidites (Cookson)

Osmundacidites parvus de Jersey

Osmundacidites senectus Balme

Stereisporites antiquasporites (Wilson and Webster)

St. Nicholas, 8' Seam (floor sample)

Alisporites australis de Jersey

Alisporites parvus de Jersey

Alisporites spp.

Annulispora folliculosa (Rogalska)

Annulispora microannulata de Jersey

Aratrisporites banksi Playford

Aratrisporites flexibilis Playford and Dettmann

Aratrisporites granulatus (Klaus)

Aratrisporites parvispinosus Leschik

Chordasporites sp.

Converrucosisporites cameroni (de Jersey)

Cyathidites sp.

Cycadopites nitidus (Balme)

Densoisporites sp.

Discisporites verrucosus de Jersey

Duplexisporites gyratus Playford and Dettmann

Lundbladispora desmondi (de Jersey)

Lycopodiacidites kuepperi Klaus

Neoraistrickia taylorii Playford and Dettmann

Osmundacidites parvus de Jersey

Osmundacidites wellmanii Couper

Punctatisporites leighensis Playford and Dettmann

Punctatisporites sp.

Punctatosporites walkomi de Jersey

Lycopodiumsporites sp.

Lycopodiumsporites subtilimuratus (Wilson and Webster)

Lycopodiumsporites reticulumsporites Leschik

[illegible]

All of the microfloras are conformable with those known previously from the late Triassic of Australia. In particular they show close affiliation with those recorded and described recently by G. Playford (J. Geol. Soc. Aust. 12 (2): 173-210) from the Brady Formation and the 'Feldspathic Sandstone' of Tasmania. On the basis of material examined, no significant qualitative disparity is evident between the various samples. It is however possible that a statistical quantitative study of the microfloral content of the coal seams and associated sediments could lead to the recognition of distinctive spore-pollen profiles (histograms) characteristic of each of the beds. Such an investigation would necessarily be based upon very closely sampled sections. On the other hand, from present indications, this possible avenue of research would be severely hampered by the generally poor preservation of the coal microfloras which scarcely allows a meaningful statistical count of the plant microfossils.

APPENDIX 3

Coal Reserves in the Northeast Coalfields from previous reports.

Locality	Coal Reserves in millions of tons		
	1922	1961	
		Indicated	Inferred
Fingal	27	3	32
Merrywood	-	¾	9
Stanhope	2	½	10
Cornwall	55	16	34
	84	20¼	85

The 1922 figures are given in metric tons and should be reduced by 10% to convert to long tons.

The 1961 estimate is stated to be 75% recoverable.

APPENDIX 4

Coal Production in the Northeast Coalfields (to December, 1966)

Mine	Output-tons
Cornwall	3,989,276
Jubilee	665,142
Mt Nicholas	1,721,072
Fingal	468,521
Duncan	915,445*
Valley	54,624
Stanhope	305,600
Mt Christie	19,609
Merrywood	416,806
Dalmayne	36,479
Seymour	28,207
	8,620,781

Total State production for the same period:

9,409,458 tons

*denotes producing mine.

APPENDIX 5

Palaeontological Report by M.R. Banks on some fossils collated by V.M. Threader from Permian limestone and underlying beds in the vicinity of Fingal.

Spec. 1: *Stenopora*, *Strophalosia* cf. *preovalis* Maxwell, sp., *Anidanthus springsurensis* (Booker) and *Cancrinella farleyensis* (Etheridge and Dun).

2: *C. farleyensis* (Etheridge and Dun), *Trigonotreta stokesii* Koenig.

3: *Polypora* sp., *Stenopora* sp., *Strophalosia* cf. *preovalis* Maxwell.

4: *Stenopora* spp., fenestellids, *Strophalosia* cf. *preovalis* Maxwell, *Tomiopsis* sp.

5: ? *Deltopecten limaeformis* (Morris)

6: *Stenopora* probably *crinita*, *Stenopora* spp., ? *Cancrinella*.

7: *Strophalosia* cf. *preovalis* Maxwell, *Cancrinella farleyensis* (Etheridge and Dun)

8: *Stenopora* cf. *grantonensis*, Crockford, *Polypora*, sp., other fenestellids.

9: *Anidanthus springsurensis* (Booker), *Tomiopsis* sp.

Anidanthus springsurensis (Booker) and *Cancrinella farleyensis* (Etheridge and Dun) are restricted in Tasmania to the Cascades Group or equivalent units. *Stenopora grantonensis* Crockford has been recorded only from the Berriedale Limestone previously but this is probably not significant. *Trigonotreta stokesii* Koenig is best developed in the Berriedale Limestone but ranges beyond that formation. *Strophalosia* cf. *preovalis* Maxwell occurs in the Nassau Siltstone in its type area but probably not in the Berriedale Limestone at Rathbones Quarry, in which the dominant *Strophalosia* is *S. jukesi* Etheridge, not present in this collection.

On the balance of evidence, all collections come from the Cascades Group or its equivalents and those specimens containing *Strophalosia* cf. *preovalis* Maxwell

from an horizon low in the Cascades Group, probably below the _Ingelarella_ and _Taeniothaerus_ zones.

APPENDIX 6

Petrological Description by G. Everard of some sedimentary rocksintersected in Department of Mines Borehole No. 6, Fingal area

Core No.	Depth	Description	Rock Type
- 123 B	600'	Pale grey, fine grained, friable rock with black, grey and white grains olose to limits of visibility with the naked eye. Bedding is indicated by discontinuous thin black carbonaceous veinlets. In thin section the rock consists of distinct angular to sub-rounded fragments, averaging .2mm. across, with orientation of the flattened and elongated particles. The grains form a mosaic with a little intergranular siliceous cement and a minimum of matrix. They comprise: 45% lithics 40% quartz and quartzite 10% feldspar 3% calcite 2% chlorite, biotite. Quartz grains are clear and angular but may show peripheral corrosion. Feldspar is usually clear and angular but sometimes so altered that the twinning is difficult to see and some feldspar may be so altered as to be unrecognisable. Microcline and albite have been identified. Mudstones tend to be opaque with rounded grains whereas quartzites are clear and angular. Some grains, however, have Intermediate qualities. These are also grains of dark basaltic rock, fragments of hornblende, chlorite, biotite and authigenic calcite.	Sub-greywacke or lithic sandstone.
60 - 123 C	773'	The handspecimen is a fine grained, friable, pale grey rock with a faint tinge of yellowish green. It shows fine disturbed depositional banding. Crinkled flakes of colourless to brownish mica about .5mm. across appear on cleavage planes. In thin section the rock is a mosaic of quartzose, lithic and feldspathic angular grains averaging about 0.1mm. across. The grains are angular and there is little interstitial cement, and the rock is quite porous. Proportions are quartz 40% lithics 35%	Lithic sandstone or sub-greywacke.

Serial No.	Depth	Description	Rock Type
		feldspar 25%. Much of the feldspar is untwinned but can be recognised by cleavage. Where twinning is present the feldspar is in the oligoclase-andesine range.	
60 - 123 D	851'	The hand specimen is a dense, pale grey, fine grained rock with visible dark grains in a white matrix. The rock is rather porous and bedding is indicated by a few thin white veinlets. In thin section it consists mainly of cryptocrystalline calcite showing a wavy aggregate extinction, suggesting a recrystallized texture. Fragments of quartz, felspar, muscovite and biotite are common with ilmenite largely altered to leucoxene and lithic fragments almost completely replaced by calcite. The clastic material which averages about .1mm. across is often surrounded by haloes of parallel short needles of calcite.	Limestone
60 - 123 E	913'	The hand specimen is a fine grained rock consisting of black, white and greyish grains averaging .5mm. across. There is a tendency towards orientation of grains and a suggestion of bedding given by platy masses and veinlets of black carbonaceous material. In thin section the grains are angular to subrounded and are merely pressed together with only the faintest evidence of siliceous cement on some of the grains. Grains consist of quartz, schistose quartzite, quartzite, feldspar (albite-oligoclase), and lithics including many dark volcanic fragments. The proportions are quartz and quartzite 30%, feldspar 15%, lithics 55% and the rock is therefore a lithic sandstone.	Lithic sandstone
60 - 123 F	921'	The handspecimen is a fine grained pale grey rock with a greenish tinge. It is rather friable and porous and consists of dark and light and intermediate coloured grains.	Sub-greywacke.

Core No.	Depth	Description	Rock Type
		In thin section it consists of angular and sub-angular grains, averaging .2mm. across, of quartz, feldspar, lithic, black carbonaceous and green chloritic and sericitic material. The grains are enclosed in a sparce matrix of very fine grained argillaceous material. Approximated proportions are matrix 8%, quartz and quartzite 20%, feldspar 12%, lithics 50% biotite, chlorite and sericite 10%, traces of zircon, apatite, topaz etc.	
63 - 123 G	1314'	The rock in hand specimen is a fine grained aggregate of black white and greyish grains. In thin section it consists of a mass of angular to sub-rounded grains averaging .35mm. across pressed together with only occasional indications of a thin siliceous cement on some grain surfaces. The grains comprise quartz and quartzite 35%, feldspar 15%, lithics 50% including some volcanic material.	Lithic sandstone
63 - 123 H	1454'	The hand specimen is a creamy-white, fine grained siliceous rock showing minute sparkling crystal faces. In thin section the rock consists of quartz grains averaging .2mm. across with about 6% of feldspar grains and 4% of lithic fragments. There is some microcrystalline quartz between the quartz grains in places. This siliceous cement seems to have been responsible for a regrowth on the original grains to give sharp cryotalline outlines which produce the sparkle seen in hand-specimen.	Quartz sandstone

APPENDIX 7

Borehole Logs

I. D.M. 1-6
II. H.E.C. C1-09
III. Cornwall Coal Co.
    Cornwall 1 and 2
    Jubilee 1
    Yates 1
IV. 1888 drilling Harefield and Killymoon

…ING TARGET:—

…ARKS:— Average recovery~98%

SURVEY DATA			ASSAY DATA										
Depth feet	Bearing mag.	Inclin. degs.	SAMPLE No.	FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	moisture	Vol	Ash	S	Fc	B.T.U
			548	380 7	382 6		100	6.3	21.0	31.2	0.28	41.5	8670

GEOLOGICAL LOG

Logged by:—

FROM	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
	89 0			No core		
0	91 6			Mudstone		
6	103 10			Feldspathic sandstone		
10	118 0			Grey mudstone with carbonaceous bands		
0	175 8			Feldspathic sandstone		
8	185 8			Grey mudstone grading into sandstone		
8	187 6			Coarse sandstone		
6	190 11			Current bedded siltstone		
11	231 0			Feldspathic sandstone with a clay pebble conglomerate at base.		
0	238 9			Interbedded mudstone and sandstone beds with 6 low grade coal beds (8",4", 1'3", 1'5", 3", 2")		*
9	261 7			Interbedded grey mudstone and carbonaceous shale		
7	377 1			Feldspathic sandstone with few thin mudstone and carbonaceous beds (this unit grades from the overlying mudstone) A 3" clay pebble conglomerage bed at 309'3" and 2" at 285'		
1	380 7			Mudstone		
7	382 6			Coal (proximate analysis No. 548)		*
6	409 5			Mudstone		
5	439 7			Feldspathic sandstone with a 3" clay pebble conglomerate at 420'0".		

Continued over:—

DEPARTMENT OF MINES — TASMANIA

DIAMOND DRILL CORE RECORD

No.:— 1	MAP SHEET No. 49	DISTRICT FINGAL

LOCATION OF SITE:— Yates Colliery (8ch, from SW corner of Lease 16M/49 on bearing 040°N)

…OF SITE:— 1724.2(Mines Dept. Survey 1966)	SITE SURVEY ON MAP No.:—	CORE SIZE:—
…NG OF HOLE:—	AIR PHOTO No.:—	COMMENCED:— 15.10.59
…ATION OF HOLE:— Vertical	DRILL:—	COMPLETED:— 15. 7.60
…S. OF SITE:—	DRILLER:— D. Hardman	FINAL DEPTH:— 715'0"

Index Page:—

No. 1 (cont'd) GEOLOGICAL LOG Page:— 2

TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
7457	0				Mudstone (carbonaceous at top), grading into current bedded sandstone and finally into feldspathic sandstone.		
0476	3				Feldspathic sandstone becoming coarse grained towards base.		
3481	0				Grey mudstone grading into sandstone at base.		
0500	3				Feldspathic sandstone.		
3519	3				Mudstone carbonaceous in part with 0'11" coal seam at 503'9".		
3548	4				Feldspathic sandstone.		
4558	0				Grey mudstone with carbonaceous bands.		
0565	0				Black mudstone.		
0567	0				Feldspathic sandstone with carbonaceous bands.		
0577	0				Grey mudstone.		
0581	0				Carbonaceous mudstone and occasional thin coal bands.		
0591	2				Grey mudstone, 4" coal band at 589'4".		
2591	4				Coal		
4595	0				Mudstone.		
0604	0				Interbedded sandstone mudstone and siltstone, Coal 2" at 600'11".		
0618	0				Shale with clay pebble conglomerate at 616'0"		
0625	2				Current bedded siltstone.		
2626	10				Interbedded sandstone and mudstone.		
0643	1				Foldspathic sandstone.		
1665	0				Interbedded sandstone, siltstone & mudstone.		
0680	3				Feldspathic sandstone with 3" conglomerate band at 666'5".		
3687	0				Grey mudstone grading into sandstone at base.		
0710	0				Fine grained sandstone grading into medium grained sandstone at base.		
0715	0				Clean grey (non-feldspathic) sandstone - probably near the base of the Triassic succession.		
					END OF HOLE 715'0"		

Continued over

ASSAY DATA

FROM ft ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

LLING TARGET:—

EMARKS:— Average recovery below 198'0" 90%

SURVEY DATA			ASSAY DATA											
DEPTH feet	Bearing mag.	Inclin. degs.	SAMPLE No.	FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	ASSAY RESULTS Moisture	Vol.	Ash	S	F.C.	B.T.U.
			1450	579 5	586 3		100	5.0	27.2	22.0	0.32	45.8	10,420
			1451	586 4	587 3		100	4.1	23.5	47.9	0.26	24.5	6,650

GEOLOGICAL LOG — Logged by:—

FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
	198 0	65 0	33	Scree		
3 0	208 0			Feldspathic sandstone		
3 0	214 0	35 0	80	Carbonaceous shale		
4 0	227 0			Feldspathic sandstone		
7 0	232 11			Coal and coaly shale		*
2 11	321 9			Feldspathic sandstone with mudstone bands and minor coaly bands		
1 9	322 0			Clay pellet conglomerate		
2 0	342 0		100	Brown mudstone grading into siltstone. 323'9 - 327'0" carbonaceeeus		
2 0	418 11			Feldspathic sandstone with grey shale and carbonaceous shale bands and a 3" conglomerate band at 390'3".		
3 11	448 0			Shale; a black coaly shale at top grading downwards into brown mudstone siltstone and finally sandstone.		
3 0	459 6			Feldspathic sandstone		
6 6	474 0			Grey mudstone grading into siltstone and sandstone		
4 0	509 6			Feldspathic sandstone becoming coarse towards base.		
6 6	511 5			Coal with 3" shale		*
1 5	520 7			Grey mudstone grading into sandstone		

Continued over:—

DEPARTMENT OF MINES — TASMANIA

DIAMOND DRILL CORE RECORD

LE No.:— 2	MAP SHEET No. 49	DISTRICT Fingal	LOCATION OF SITE:— (2 ch. W of midpoiht of west boundary of lease 16M/49)
OF SITE:— 19970" (Mines Dept. Survey 1966)	SITE SURVEY ON MAP No.:—		CORE SIZE:—
MING OF HOLE:—	AIR PHOTO No.:—		COMMENCED:— 18.7.60
NATION OF HOLE:— Vertical	DRILL:—		COMPLETED:— 29.9.61
FOS. OF SITE:—	DRILLER:— D.R. Hardman		FINAL DEPTH:— 603'8"

Index Page:—

M4373

SINGAL NO2. (Cont'd) — GEOLOGICAL LOG — Page:— 2

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
527		579	4				Fine grained sandstone grading into medium grained sandstone at 527'0" clay pebble conglomerate at 560'6"		
579	4	579	5				Carbonaceous shale		
579	5	580	8				Coal		
580	8	580	9				Carbonaceous shale		
580	9	586	3				Coal		
586	3	586	4				Carbonaceous shale		
586	4	587	3				Coal		
587	3	592	7				Grey shale and carbonaceous shale		
592	7	595	4				Feldspathic sandstone		
595	4	597	0				Grey shale and carbonaceous shale -		
597	0	603	8				Feldspathic sandstone		
							End of hole 603'8"		

Continued over

ASSAY DATA

SAMPLE	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

LLING TARGET:—

ARKS:— Average recovery 95%

SURVEY DATA			ASSAY DATA											
PTH ft	Bearing mag.	Inclin. degs.	SAMPLE No.	FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	% Moist.	% Vol.	ASSAY RESULT % Ash	% S	% F.C.	B.T.U.
			3640	513 0	515 0	1 10	95	4.7	27.5	24.5	0.40	43.5	10,120
			3641	615 1	617 6	2 0	95	5.1		56.0			
			3642	689 8	694 1	4 2	95	4.3	25.2	22.7	0.36	47.8	10,260
			3643	694 1	695 3	1 0	95	3.3	27.6	41.4	0.27	27.7	7,380
			3644	695 3	697 4	1 5	67	5.5	21.8	46.5	0.27	28.8	6,450

GEOLOGICAL LOG — Logged by:—

TH ft.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
	290			Dolerite		
0	290 6			Weathered coaly mudstone		
6	297 0			Weathered grey mudstone		
0	311 3			Grey mudstone with thin light & dark bands.		
3	318 9			Feldspathic sandstone		
9	319 3			Flecks of coaly shale in feldspathic sandstone		
3	319 9			Vitreous coal band		*
9	331 8			Dark grey mudstone, a few bands of coaly shale at top & a band of 6" feldspathic sandstone at 327'0"		
8	422 7			Feldspathic sandstone with occasional coaly bands; a 2' band of current bedded siltstone at 405'3"		
7	423 1			6" coal		
1	425 5			Coal and coaly shale		
5	439 9			Dark shale		
9	466 6			Fine grained feldspathic sandstone.		
6	471 1			Coaly shale		
1	473 10			Grey mudstone.		
10	498 10			Medium grained feldspathic sandstone.		
10	499 3			Coaly shale		
3	513 0			Coarse feldspathic sandstone with few thin coal and coaly bands.		

Continued over:—

DEPARTMENT OF MINES — TASMANIA

DIAMOND DRILL CORE RECORD

E No.:— 3	MAP SHEET No. 49	DISTRICT Fingal	LOCATION OF SITE:—

Drilled on Crown Land 12 chains from NE corner of lease 26M/49 (Yeat's Colliery) on bearing 293°M

OF SITE:- 2106.0 (Mines Dept. Survey 1966)	SITE SURVEY ON MAP No.:—	CORE SIZE:—
NG OF HOLE:—	AIR PHOTO No.:—	COMMENCED:— 11-10-61
ATION OF HOLE:— Vertioal	DRILL:—	COMPLETED:— 10-7-62
% OF SITE:—	DRILLER:— D.R. Hardman	FINAL DEPTH:— 711'0"

Index Page:—

Fingal No. 3 (cont'd) GEOLOGICAL LOG

FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
30	515	0	1	10	95	Coal	*	
50	533	3				Grey mudstone		
53	558	3				Feldspathic sandstone, few thin coal parting at top.		
33	564	3				Mudstone, coaly at top		
43	615	1				Feldspathic sandstone coarse at base		
51	617	6	2	0	95	Coal with shaly bands	*	
76	618	6				Coaly shale		
36	620	10				Dark grey shale		
010	668	5				Feldspathic sandstone		
35	669	1				Dark brown carbonaceous shale		
91	689	7				Feldspathic sandstone with thin coaly bands		
97	689	8				1" coaly shale		
98	694	1	4	2	95	Coal with coaly shale bands	*	
41	695	3	1	0	95	Shaly coal		
53	697	4	1	5	67	Coal		
74	699	6				Medium grey mudstone		
96	711	0				Medium grained feldspathic sandstone		
						END OF HOLE 711'0"		

Continued over

ASSAY DATA

SAMPLE No.	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

LLING TARGET:— Fingal No. 4

MARKS:—

SURVEY DATA			ASSAY DATA												
EPTH ft.	Bearing mag.	Inclin. degs.	SAMPLE No.	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	% Moist.	% Vol.	ASSAY RESULTS Ash.	S%	%Cal. Val... F.C.	B.T.U.
rface	V	Vert.	232	141	4	143	4	0	9	75	4.1	23.1	29.5	0.29	43.3	9,060
00	V	89°15'	308	233	2	236				90	6.2	21.9	33.1	0.33	38.8	8,320
30	wedge	88°45'	309	238	6	242	9	3	3	90	4.9	30.7	18.5	0.50	45.9	10,830
30	159.30	88°10'		373	0	375	6	1	6	90	3.1	14.1	60.5	-	22.2	-
30	V	90°00'		402	8	405	0	1	3	53	3.8	18.0	46.1	-	32.1	-
30	161.45	88°45'		419	7	421	3	1	6	97	3.7	18.9	50.4	-	27.0	-
50	V	90°00'		526	2	527	11	1	6	100	3.5	27.1	26.4	0.44	42.9	9,490
00	V	89°49'		543	0	545	0	2	0	100	3.5	23.4	28.3	0.77	44.8	9,570
				583	2	584	6	1	3	100	3.7	25.6	36.0	-	34.7	-
				591	0	593	0	2	0	100	3.4	25.2	21.8	0.39	49.6	10.580
				610	9	612	3	1	6	100	2.8	23.1	37.1	-	37.0	-

GEOLOGICAL LOG — Logged by:— V.M. Threader

OM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
	41	0	12	6	30	Mud and weathered dolerite		
0	55	0	7	6	54	Brown friable sandstone		
0	62	0	7	0	100	Grey mudstone with carbonaceous flecks		
0	68	0	2	3	56	Shale and shaly coal		
0	70	0	2	0	100	Coaly shale		
0	70	6	0	6	100	Coal		
6	71	6	0	9	75	Grey-brown mudstone		
6	71	8	0	2	100	Coal		
8	90	0	12	0	)	Grey shale, few coal pennies at 83'		
0	93	0			)	Grey sandy mudstone		
0	141	4			)	Grey tobrown medium to coarse grained feldspathic		
					)	sandstone probable faults at 105'6" and 108'3"		
					)App.	both 20° to core also fault gouge at 110'0"		
4	143	4		9	) 90	Coal (sampled)		
4	144	10			)	Black and grey carbonaceous shale		
10	145	2		4	)	Coal		
2	145	7			)	Soft grey clay		
7	146	1		6	)	Coal		
1	151	8			)	Grey and black shale with narrow bands of coal		
8	152	2		6	)	Dight grey mudstone		
2	152	5		3	)	Coal		

Continued over:—

DEPARTMENT OF MINES — TASMANIA

DIAMOND DRILL CORE RECORD

LE No.:	MAP SHEET No.	DISTRICT	LOCATION OF SITE:—
Fingal No. 4	49	Fingal	

L.B.M. road approximately ¾ mile beyond access road to Valley mine

OF SITE:—	SITE SURVEY ON MAP No.:—	CORE SIZE:—
1793.1 (Mines Dept Survey 1966)		NX to 38'BX to 90' AX to 1083'1"
RING OF HOLE:—	AIR PHOTO No.:—	COMMENCED:—
		24/8/62
LINATION OF HOLE:—	DRILL:—	COMPLETED:—
Vertical	B12 (F200 to 242')	30/7/65
ORDS. OF SITE:—	DRILLER:—	FINAL DEPTH:—
(approx.) 871000N/529000E State Grid.	A.Roberts D. Hardman	1083 feet.

Index Page:—

Fingal No. 4 (cont'd) GEOLOGICAL LOG

FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
5	167	6				Grey mudstone		
6	226	6				Grey to brown, medium grained feldspathic sandstone with occasional coaly and shaly partings slight fracturing (10° to core) at 200 ft.		
6	226	11		5		Brown, shaly coal		
11	233	2				Grey mudstone slightly carbonaceous		
2	256					Shaly coal and 2" shale band at 234'2"		
-	238	6				Grey mudstone		
6	242	9	3	3		Coal		
9	243	7				Black mudstone		
7	245					Grey sandy mudstone with some carbonaceous matter		
-	234	-			app.	Fine feldspathic sandstone		
-	280	-				Coarse feldspathic sandstone with few coaly partings		
-	282	-			90%	Mudstone and sandstone mixture - Breccia conglomerate		
-	302	6				Grey feldspathic sandstone with few shale and coal pennies		
6	307	-				Mixture of mudstone bands and feldspathic sandstone		
-	323	4				Medium to coarse feldspathic sandstone		
4	325	6				Grey shale		
6	329	10				Bark carbonaceous shale with 3" coaly band at 329'8"		
10	332	8				Dark brown carbonaceous shale		
8	333	8				Dull coal		
8	339	-				Dark brown carbonaceous shale becoming lighter towards base		
-	357	8				Fine feldspathic sandstone shaly 354-356		
8	372	6				Feldspathic snadstone with few coaly bands		
6	373	-				Dull dark brown carbonaceous shale		
-	375	6				Coal		
6	376	8		6	43	Grey clay		
8	379	6	2	0	66	Grey mudstone		
6	379	9	0	3	100	Grey clay		
9	384	0	2	4	55	Grey mudstone		
0	384	3		3	100	Coaly shale		
3	402	8	3	1	36	Grey mudstone		
8	405	-	1	3	53	Coal		

Continued over

ASSAY DATA

SAMPLE	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Fingal No. 4 (cont'd) GEOLOGICAL LOG Page:— 3

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
405	0	405	8		8	100	Grey mudstone		
405	8	406	0		4	100	Coaly mudstone		
406	0	408	6		2	7	Coal		
408	6	410	11	1	0	41	Grey mudstone		
410	11	413	5	2	0	80	Coaly mudstone		
413	5	419	7	6	0	98	Grey mudstone with coaly fragments, in places coaly shale.		
419	7	421	3	1	6	97	Coal with narrow clay partings		
421	3	425	6	4	3	100	Grey mudstone with coaly fragments		
425	6	426	7		7	53	Coal		
426	7	430	0	3	5	100	Grey mudstone		
430	0	458	6	28	0	99	Feldspathic sandstone with coaly bands at:- 432'6", 448'0", 451'- 453', 455' - 456'.		
458	6	463	0	2	6	55	Grey mudstone with coaly bands		
463	0	463	6	0	6	100	Shaly coal		
463	6	467	8	4	4	100	Grey mudstone		
467	8	467	2		2	100	Coal		
467	2	467	8		6	100	Fine grained sandstone with coaly bands		
467	8	472	1	3	3	73	Coaly mudstone		
472	1	473	0		9	82	Coal		
473	0	475	6		6	20	Grey mudstone		
475	6	477	0	1	0	67	Coaly mudstone		
477	0	482	0	4	0	80	Fine grained sandstone with coaly partings and patches of coal.		
482	0	482	6		5	97	Coaly mudstone		
482	6	526	5	44		100	Feldspathic sandstone with carbonaceous bands at 503'0" - 503'6", 507'0" - 507'6", & 509'8" - 510'0"		
526	5	527	11	1	6	100	Coal		
527	11	529	0		6	50	Black shale		
529	0	542	6	10	0	83	Grey mudstone		
542	6	542	7	0	1	100	Friable carbonate rock		
542	7	542	9		2	100	Hard black coaly shale with calcite veins		
542	9	543	0	9	0	90	Grey mudstone with coaly bands		
543	0	545	0	2	0	100	Coal		
545	0	564	0	9	0	100	Grey mudstone with coaly bands		

Continued over

ASSAY DATA

SAMPLE No.	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Fingal No. 4 (cont'd) GEOLOGICAL LOG Page:— 4

FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
2 0	573 0	5 3	58	Grey sandstone with occasional streaks of dark fine grained mudstone. - increases to 50% over last 3 feet.		
3 0	574 0	1	100	Coal		
2 0	575 6	1 6	100	Black shale		
5 6	578 7	3 0	99	Feldspathic sandstone with coaly fragments		
3 7	583 2	4 10	92	Grey mudstone		
3 2	584 6	1 4	100	Coal		
2 6	587 10	4 4	75	Dark grey sandstone		
7 10	591 0	2 1	64	Grey mudstone		
1 0	591 3	3	100	Black shale		
1 3	593 0	1 9	100	Coal		
3 0	593 6	6	100	Black shale		
3 6	610 9	14 9	86	Grey mudstone		
2 9	612 3	1 6	100	Coal		
2 3	612 9	6	100	Fine grained sandstone or siltstone		
2 9	618 0	5 1	96	Sandstone with occasional shaly partings - carbonate veins at 616.		
13 0	632 5	11 9	82	Grey with carbonate bands		
2 5	633 7	11	80	Sandstone		
3 7	636 6	2 9	95	Black shale		
5 6	644 10	8 0	97	Grey mudstone		
1 10	712 11	39 6	58	Feldspathic sandstone.		
2 11	715 3	2 0	86	Feldspathic sandstone with coal fragments and partings (714'0" - 714'3")		
13 3	727 0	11 6	75	Interbedded sandstone and mudstone.		
7 0	736 6	9 0	95	Feldspathic sandstone with random mudstone fragments and partings		
5 6	758 6	21 0	95	Feldspathic sandstone		
3 6	758 11	5	100	Dull coal		
3 11	764 0	5 6	90	Banded siltstone		
2 0	765 9	1 6	85	Feldspathic sandstone		
5 9	767 0	1 3	100	Grey mudstone		
7 0	769 0	2 0	100	Fine grained sandstone with mudstone laminations.		

Continued over

ASSAY DATA

SAMPLE No.	FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Fingal No. 4 (cont'd) GEOLOGICAL LOG Page:— 5

FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
0	783	0	14	0	100	Dark grey mudstone with fine grained sandstone laminations.		
0	786	0	2	0	66	Sandstone with shaly partings		
0	786	9		9	100	Coaly shale with fine grained calcite		
9	790	9	3	0	100	Feldspathic sandstone		
9	792	3	1	6	100	Dark grey to black shale		
3	793	0		6	66	Feldspathic sandstone		
0	804	0	6		66	Becoming sandy toward base		
0	834	0	27	0	90	Coarse grained cream coloured sandstone with pebbly sections and coaly partings.		
0	834	9		9	100	Transitions from sandstone to mudstone		
9	843	1	8	6	90	Dark grey uniform mudstone (Fermian beds)		
1	1014	10	165	0	91	Dark grey uniform mudstone with occasional calcite beds and scattered angular grits		
10	1017	4	2	6	100	Medium grey coarse grained sandstone		
4	1031	0	12	6	96	Dark grey mudstone with scattered pebbles		
0	1034	0	3	6	86	Grey coarse grained sandstone, scattered pyrite crystals.		
0	1083	1	47	0	96	Limestone shaly in part, with green (Glauconite) patches near start becoming uniform buff colour towards end of hole.		
						1083'1" end of Hole.		

Continued over

ASSAY DATA

FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

LING TARGET:—

MARKS:—

SURVEY DATA

DEPTH ft.	Bearing mag.	Inclin. degs.

ASSAY DATA

SAMPLE No.	FROM ft.	ins.	TO ft.	ins.	RECOVERY ft.	ins.	%	ASSAY RESULTS Moist	Vol.	Ash	Sulphur	F.C.	B.T.N.
1	317	0	320	0	2	6	83	6		34.5			
2	327	0	331	0	4	0	100	4.9	27.3	25.0	0.39	42.8	9.880
3	469	2	472	6	3	0	90	5.9	25.3	25.8	0.53	45.0	10.050
4	482	9	488	8	5	11	90	4.3	22.5	29.4	0.25	43.8	9.170
5	391	6	600	6	2	8	28	3.2	22.6	34.7		39.5	
6	619	0	623	0	3	4	83	3.7	18.9	46.4		31.0	

GEOLOGICAL LOG — Logged by:—

FROM ft.	ins.	TO ft.	ins.	RECOVERY ft.	ins.	%	DESCRIPTION	SECTION Core	Sample
0		8	0	—	—		No core.		
0		20	0	2	0	5	Dolerite (probably seree)		
0		25	6	1	0	62	Carbonaceous mudstone		
6		27	0	1	0	62	Light grey mudstone		
0		33	0	5	0	83	Light grey fine grained sandstone		
0		87	0	48	0	87	Feldspathic sandstone, coaly streaky and fragments at 66'0" - 68'6" and shale fragments at 74'6" - 75'0".		
0		89	0	1	9	86	Fine grained sandstone with streaks of black shale.		
0		127	0	28	0	74	Feldspathic sandstone, highly carbonaceous shale 98'0" - 99'0" and shale with carbonaeeous fragments 99'6" - 100'0"		
0		128	8	1	8	100	Shaly coal with 2" clay seam		
8		133	8	5	0	100	Grey mudstone		
8		134	4	0	8	100	Coal containing 1" clay seam & shaly fragments		
4		198	6				Feldspathic sandstone with coal and shaly fragments 163'0" - 167'0"		
6				6	)		Coal		
				4	)		Dark grey mudstone		
				9	)	100	Light grey clay		
		200	6	5	)		Coal		

Continued over:—

DEPARTMENT OF MINES — TASMANIA

DIAMOND DRILL CORE RECORD

No.: Fingal 5	MAP SHEET No. 49	DISTRICT Fingal	LOCATION OF SITE:— No. 3 to 35'0" BX to 509'0" NX to 84'0" AX to 884'6"

In head waters of Cardiff Creek
64 ch. from B.H. 4 on bearing of 262°M

OF SITE:— 1889.4 (Mines Dept. Survey 1966)	SITE SURVEY ON MAP No.:—	CORE SIZE:—
NG OF HOLE:— -	AIR PHOTO No.:—	COMMENCED:— 20-8-65
NATION OF HOLE:— Vertical	DRILL:— 12 B	COMPLETED:— 29-10-65
OG. OF SITE:— -	DRILLER:— G. Burns	FINAL DEPTH:— 884'6"

Index Page:—

Fingal No. 5 (Cont'd) — GEOLOGICAL LOG — Page:— 2

FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY Ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
6	212	0	11	6	100	Mudstone grading into fine grained sandstone at base.		
0	249	0	37	0	100	Feldspathic sandstone, streaked with thin shale bands.		
0	316	10	67	0	98	Feldspathic sandstone, coaly bands at 261'4"-261'8", 283'-285', 300'-301'		
0	320	0	2	6	83	Coaly feldspathic sandstone grading into coaly shale.		
0	327	0	6	6	93	Black shale grading into dark grey mudstone with silty fractions.		
0	331	0	4	0	100	Coal	*	
0	541	0	9	0	90	Grey mudstone		
0	342	6	1	6	100	Dull coal	*	
6	352	0	9	6	100	Grey mudstone		
0	552	9		9	100	Feldspathic sandstone		
9	357	9	3	0	100	Grey mudstone becoming silty towards base		
9	364	0	9	3	100	Fine grained feldspathic sandstone		
0	403	0	39	0	100	Feldspathic sandstone with shaly fragments 391'-391'6"		
0	403	9		9	100	Black mudstone		
9	405	9	2		100	Grey mudstone		
9	413	6	7	9	100	Feldspathic sandstone streaked with shaly bands, becoming predominantly mudstone towards base.		
6	418	6	4	6	90	Dark grey mudstone.		
6	469	2	50	8	100	Feldspathic sandstone with coaly fragments. 466'0" - 469'2"		
2	472	6	3	0	90	Coal	*	
6	473	2	0	8	100	Dull coal.		
2	482	0	8	0	91	Light grey crumbly mudstone		
0	488	8	5	11	90	Coal	*	
8	494	6	5	9	88	Light brown clay		
6	496	8	1	2				
8	510	0	12	6	93	Dark grey mudstone.		

Continued over

ASSAY DATA

FROM ft.	FROM Ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Hole No. 5 (Cont'd) — GEOLOGICAL LOG — Page:— 3

FROM ft.	TO ft. ins.	RECOVERY ft. ins.	%	DESCRIPTION	SECTION Core	SECTION Sample
0	511 0	0 10	83	Coal	*	
0	519 0	7 0	100	Fine grained sandstone with coaly partings and fragments.		
0	519 3	0 3	100	Grey shale with coaly partings		
3	521 0	1 9	100	Coal with shaly partings	*	
0	570 1	49 1	100	Feldspathic sandstone		
0	574 5	3 6	80	Grey mudstone		
5	574 9	4	100	Coal	*	
2	578 6	3 9	100	Fine grained sandstone with coaly partings		
6	585 0	4 6	69	Black grading downwards into laminated siltstone		
0	591 6	6 6	100	Fine grained laminated sandstone grading downwards into coarse grained sandstone		
0	598 7	2 6	35	Coal (578ft.6in. - 591ft.6in.a graded*unit)		
7	600 6	2	6	Fragments of coal		
6	619 0	18 2	100	Grey mudstone with occasional calcite oartings		
0	619 1	0 1	100	Calcite seam		
1	620 3	1 0	)	Coal	*	
3	620 7	0 4	) 83	Mudstone		
7	623 0	2 0	)	Coal	*	
0	634 0	10 6	96	Mudstone		
0	645 0	11 0	100	Current bedded siltstone) graded unit		
0	655 6	12 0	87	Sandstone)		
6	656 1	0 6	86	Coal	*	
1	663 0	7 0	78	Laminated coaly siltstone		
0	673 11	10 6	96	Feldspathic sandstone		
11	674 2	0 3	100	Coal	*	
2	675 2	1 0	100	Fine grained sandstone		
2	676 2	1 0	100	Siltstone .		
2	679 2	3 0	100	Coal	*	
2	695 0	13 0	82	Mudstone		
0	729 0	32 0	94	Siltstone		
0	738 6	9 6	100	Medium grained brown sandstnne - slightly carbonneeous		
6	741 8	2 6	77	Medium grained grey sandstone with coaly bands		

Continued over

ASSAY DATA

FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	%	ASSAY RESULTS

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G TARGET:—

KS:—

SURVEY DATA			ASSAY DATA										
H	Bearing mag.	Intlin. degs.	SAMPLE No.	FROM ft. ins.	TO ft. ins.	RECOVERY ft. ins.	%	ASSAY RESULTS Moist.	Vol.	F.C.	Ash %	BTU/lb	
			827/1	721 0	723 6	2 6					57.3	-	
			2	724 0	726 6	2 6					43.3	-	
			3	815 8	819 0	3 4	100						
			774/1	1000 10	1003 10	2 3		4.4	22.3	52.0	21.3	10,144	
			2	1003 10	1006 10	2 3	90	3.3	26.6	50.9	19.2	10,755	
			3	1006 10	1009 10	2 3		2.9	26.1	34.1	36.9	8,190	
			827/4	1126 0	1131 6	5 0	100				39.4		

GEOLOGICAL LOG — Logged by:—

H	TO ft. ins.	RECOVERY ft. ins.	%	DESCRIPTION	SECTION Core	Sample
0	425 0	-	app 95	Jurassic dolerite. Bottom 3 ft. is fine grained due to chilling at contact.		
0	428 0	3 0	100	Indurated sediments, dark grey and flint-like. Dolerite/sediment contact is inclined at 50° to core length (i.e. dip 40°)		
0	435 0	5 0	100	Feldspathic sandstone with black banding.		
0	439 0	6 0	100	Fine grained feldspathic sandstone.		
0	452 0	13 0	100	As above with black banding. Current bedded in part.		
0	480 0	26 9	95	Feldspathic sandstone. 458' 1" band of clean fine grained sandstone 461-466 dark grey banding 466-467 and 473-475 clay pellet conglomerate.		
0	480 6	0 6	100	Black shale		
0	481 6	0 6	100	Feldspathic sandstone		
6	486 6	5 0	100	Current bedded banded siltstone		
6	521 0	34 6	100	Current bedded feldspathic sandstone 500-501 banded mudstone 503, 504 and 513 siltstone bands 519 coaly band 520-521 colour change to yellow (weathered)		

Continued over:—

DEPARTMENT OF MINES — TASMANIA

DIAMOND DRILL CORE RECORD

E No.:— 6	MAP SHEET No. 49	DISTRICT FINGAL	LOCATION OF SITE:— 0.32 (No. 4 32-72 (No. 3 72-350 W 350-825 (B 825 - 1502 (A.

50 feet from Duncan adit portal on 100° M

OF SITE:— 2427 H	SITE SURVEY ON MAP No.:—	CORE SIZE:—
ING OF HOLE:—	AIR PHOTO No.:—	COMMENCED:— 19-11-65
NATION OF HOLE:— Vertical	DRILL:— 12B	COMPLETED:— 8-2-68
GS. OF SITE:—	DRILLER:— D. Hardman	FINAL DEPTH:— 1502 ft. Cns.

K6376

Fingal No. 6 (cont'd) GEOLOGICAL LOG Page:— 2

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
0		542	0	20		98	Feldspathic sandstone		
							522'3" - 523'2" coaly lenses		
							523'2" - 540'9" change to yellow feldspathic sandstone		
0		561	10	19	10	100	Interbedded carbonaceous mudstone, coal and clay:		
							1ft 3 ins. Coal		
							0 3 Mudstone		
							0 4 Coaly mudstone		
							9 Clay		
							1 10 Dull coal with mudstone partings		
							0 3 Mudstone		
							0 4 Dull coal		
							3 Mudstone		
							4 Dull coal		
							1 8 Clay stone		
							1 5 Dull coal		
							10 Mudstone or clay		
							4 6 Dull coal with mudstone partings		
							2 2 Mudstone		
							3 0 Coal with mudstone partings		
							2 Mudstone		
							6 Dull coal		
							19 10		
561	1	566	1	4	3	100	Mudstone		
566	1	615	5	49	2	100	Feldspathic sandstone, fine grained at top and grading into overlying mudstone		
							Medium grained below 578'0"		
							At 580'0" - 1" Very coarse open textured feldspathic sandstone		
							At 585'9" - 2" clay pellet conglomerate		
							579'5", 581'9", 583'0" - mudstone bands		
							590'-600' coaly partings in fine grained sandstone		

Continued over

ASSAY DATA

SAMPLE No.	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

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Fingal No. 6 (cont'd) GEOLOGICAL LOG

TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
					600'0" - 610'0" medium grained.		
					610 - Sharp change to underlying banded siltstone		
					613'6" grading to medium and coarse underlying sandstone with coal lenses at base.		
616	3	1	0	100	Clay pellet conglomerate with coal lenses.		
618	0	1	9	100	Black and grey shale.		
625	0	7	0	100	Grey shale.		
					Banded and current bedded interbedded grey siltstone & mudstone becoming coarser at base.		
721	0	96	0	100	Feldspathic sandstone.		
					625'0"-630'0" fine grained.		
					630'0" coarse to medium grained, fining upwards.		
					662'0" clay pellet conglomerate (2")		
					663'0" coal lenses over 3"		
					675'4"-677'6" coarse feldspathic sandstone containing coaly partings.		
					677'6"-678'0" coal		
					681'3" 1" vitreous coal		
					682'3"-683'0" grain size grades upwards from coarse at base to fine, and changes back to coarse at top.		
					692'5"-700'0" grain size changes from medium at base to coarse at top.		
					700'4"-701'0" mudstone band grading upwards into feldspathic sandstone.		
					702'0" 3" scattered clay pellet conglomerate.		
					703'0"-703'10" mudstone		
					709'6"-711'6" coaly partings.		
					712'0"-712'8" clay pellet conglomerate.		
					713'3"-714'6" coaly portions in feldspathic sandstone with a siltstone band at each end.		
					714'6"-716'0" fine grained with banded siltstone, grading to medium grained at base.		
					716'6" 1" vitreous coal.		

Continued over

ASSAY DATA

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Fingal No. 6 (cont'd) — GEOLOGICAL LOG — Page:— 4

TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
727	11	5	11	100	0' 6" Vitreous coal) Sample No. 1 1' 1·1" Carbonaceous mudstone) 0' 1" Vitreous coal) 0' 7" Brown clay 0' 11" Carbonaceous mudstone) 0' 8" Vitreous coal) 0' 1" Brown clay) Sample No. 2 0' 6" Vitreous coal) 0' 2" Brown clay) 0' 6" Vitreous coal) 5' 11"		
730	0	2	1	100	Grey mudstone with 9" clay at 728'9"		
751	0	21	0	100	Interbedded mudstone and current bedded siltstone grading into sandstone at base.		
798	7	47	7	100	Feldspathic sandstone 758'0" - 759'6" Coaly partings 762'3" - 764'6" Coal lenses 766'6" - 767'6" Coarse grained 767'6" - 768'0" Medium grained 768'0" - 769'8" fine grained and interbedded with banded siltstone 784'0" - 790'8" Medium grained with occasional clean fine grained sandstone bands, grading into finer material at top. 790'8" - 790'10" Coarse grained. 790'10"- 791'4" Fine grained and banded and containing carbonaceous partings, grades into coarse grained at base. 794'11"- 795'11" Coal lenses 797'9" - 798'7" Coal lenses		
809	9	11	2	100	Coarse grained feldspathic sandstone 800'7" - 801'8" Coal lenses 802'8" - 803'5" Medium grained 805'9" - 806'3" Clay pellet conglomerate.		

Continued over

ASSAY DATA

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Fingal No. 6 (cont'd) GEOLOGICAL LOG

TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
9 810	3	0	6	100	Coal		
3 812	1	1	8	100	Grey siltstone.		
1		3	6		Laminated grey mudstone.		
		2	6	76	Coal containing a 2in. and a ½" clay band (sampled)		
824	6	2	0		Grey mudstone grading into siltstone and feldspathic sandstone towards base.		
5 830	0	5	0	95	Medium grained feldspathic sandstone		
0 840	0	10	0	100	Grey mudstone with 1" calcite vein at 835'0"		
2		0	7		Fine grained sandstone.		
		1	2		Grey mudstone		
		1	0	100	Medium grained feldspathic sandstone.		
843	0	0	3		Grey mudstone.		
0 855	4	12	4	100	Medium grained feldspathic sandstone with clean fine grained grey sandstone bands 851'0" - 851'6" 852'0" - 853'9"		
4 869	0	13	8	100	Mudstone, carbonaceous: 855'4"-856'3" and coal: 863'2"-865'0" (vitreous in middle)		
0 875	0	4	7	95	Interbedded mudstone & siltstone becoming coarser at base to interbedded sandstone and siltstone.		
0 918	4	43	4	100	Medium grained feldspathic sandstone. 877'6"-878'0" coarse grained 879'0"-879'6" fine sandstone band 883'6"-900'3" coarse grained coaly lenses & irregular patches for 3'6" from 884'6" & at 890'0" 900'3" 1" fine grained black banded section 900'4"-900'10" coarse grained		
4 922	8	4	3	90	Banded mudstone 2" dark grey at start, 919'0" - 920'0" silicified. 1'0" of fine grained sandstone at 921'10"		
8 925	6	2	8	90	Coal.		
6 929	7	4	1	100	Grey mudstone		

Continued over

ASSAY DATA

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

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Fingal No. 6 (cont'd) GEOLOGICAL LOG Page:— 6

TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
933	1	3	6	100	Interbedded mudstone and current bedded siltstone grading into sandstone at base.		
1000	0	66	11	100	Medium grained felspathic sandstone with coaly partings 936'7" - 938'9"		
					954'6" - 957'9" Fine grained		
					974'0" - 976'3" Clay pellet conglomerate		
					979'6" - 988'3" Fine-medium grained		
					982'0" - 982'3" Coal lenses and flecks		
					983'0" - 983'3" " " " "		
					984'0" - 984'1" " " " "		
					988'3" - 989'9" " " " "		
					995'0" - 995'1" " " " "		
1010	0	9	0	90	Coal		
					0" 3" Shaly Coal		
					0' 2" Coal		
					0" 5" Dark grey mudstone		
					(5' 6" Coal		
				Samples	(0' 1" Grey mudstone		
					(1' 9" Coal		
					0' 10" Coaly shale		
					9' 0"		
1012	11	2	1	70	Grey mudstone		
1043	9	30	8	89	Felspathic sandstone		
					1012'11" - 1016'0" medium grained		
					1016'0" - 1043'9" Coarse grained		
1045	7	1	10	100	Grey mudstone with carbonaceous mottling and 1" carbonaceous mudstone at top.		
1047	4	1	9	100	Fine grained felspathic sandstone interbedded with fine banded siltstone		
1048	0	0	8	100	Dull coal		
1049	6	1	6	100	Banded mudstone		
1050	0	0	6	100	Banded siltstone		
1056	0	6	0	100	Fine grained sandstone.		

Continued over

ASSAY DATA

FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

Fingal No. 6 (cont'd) GEOLOGICAL LOG Page:— 7.

TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	DESCRIPTION	SECTION Core	SECTION Sample
1100	9				Medium grained feldspathic sandstone grading to coarse at 1084'0"		
1101	9	1	0	100	Fine grained feldspathic sandstone		
1102	11	0	8	100	Clay pellet conglomerate		
1133	0	30	1	100	Banded mudstone grading into siltstone at base 1119'7" - 1120'10" coal 1126'0" - 1131'0" coal containing two 1" mudstone bands.		
1163	0	29	6	99	Feldspathic sandstone fine grained at top and grading to coarse at 1143 - 1147		
1164	4	1	4	100	0'6" c[illegible]nd 0'10" coaly shale		
1175	7	8	7	85	Grey mudstone with a fine grained feldspathic sandstone band at 1170'0" - 1171'0"		
[illegible]					[illegible]		
1200	0	5	0	85	Medium grained feldspathic sandstone with interbedded banded mudstone 1183'11" - 1184'10"		
1209	0	7	3	85	Banded mudstone grading to siltstone at base 1200'8" - 1200'11" carbonaceous 1200'11" - 1201'9" feldspathic sandstone		
1220	6	10	9	85	Feldspathic sandstone, coarse grained below 1217'0"		
1225	0	3	4	80	Carbonaceous mudstone, coal at base		
1236	0	10	4	85	Grey mudstone grading down to siltstone at 1229'0" and fine grained sandstone at base.		
1243	9	7	9	100	Medium-fine feldspathic sandstone with interbedded current bedded-sandstone 1242'7" - 1243'9"		
1254	2	9	2	95	Fine grained feldspathic sandstone		
1258	6	4	4	100	Medium grained feldspathic sandstone		
1286	6	26	0	95	Grey mudstone with slightly carbonaceous sections		
1307	0	19	0	93	Grey current bedded and banded siltstone		
1308	0	1	0	100	Fine grained current bedded sandstone		
1319	0	10	8	98	Medium grained feldspathic sandstone		
1326	0	7	0	100	Grey mudstone, carbonaceous at base		
[illegible]		10	0	100	Grey siltstone		
[illegible]		1	0	100	Fine grained feldspathic sandstone		
1361	6	24	6	100	Medium grained feldspathic sandstone with carbonaceous partings at 1341 - 1342 ft. and clay pellets at 1352 - 1352'6"		
[illegible]		1	9	100	Banded siltstone		

Continued over

ASSAY DATA

SAMPLE	FROM ft.	FROM ins.	TO ft.	TO ins.	RECOVERY ft.	RECOVERY ins.	RECOVERY %	ASSAY RESULTS

Index Page:—

TO ft.	ins.	RECOVERY ft.	ins.	%	DESCRIPTION	SECTION Core	Sample
1369	6	6	6	100	Medium grained feldspathic sandstone		
1371	0	1	6	100	Grey siltstone with carbonaceous bands		
1386	0	15	0	100	Medium grained feldspathic sandstone, clay pellet conglomerate band at 1382ft-1383 ft 6"		
1387	6	1	6	100	Fine grained feldspathic sandstone		
1394	9	6	0	82	Banded siltstone - fine grained sandstone		
1418	0	22	3	100	Banded mudstone - siltstone		
1480		59	0	94	Medium grained creamy sandstone interbedded with dark grey to black very fine grained sandstone bands		
1494	0	11	0	95	Banded sandstone - siltstone		
1502	0	8	0	100	Banded mudstone with scattered grits.		
					The Permian Boundary is at 1480 ft. 0 in.		
					End of hole 1502 ft. 0 in.		

Continued over

ASSAY DATA

FROM ft.	ins.	TO ft.	ins.	RECOVERY ft.	ins.	%	ASSAY RESULTS

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HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL - HOLE CI.

ft.	in.	ft.	in.	Remarks
0		380	10	Dolerite scree
380	10	383	4	Fine grained brecciated mudstone and sandstone weathered insitu to angular rock fragments and clay. Travertine at contact.
383	4	385	0	Fine grained light grey jointed mudstone.
385	0	386	0	Coal bed with moderately pure layers, of vitrinite. Becomes more impure towards 386' where it grades into mudstone. Gypsum veins up to $\frac{1}{8}$".
386	0	390	0	Light coloured mudstone weathered to clay at 389'.
390	0	391	9	Carbonaceous mudstone.
391	9	409	8	Dark grey fine grained mudstone, weathered to clay and small fragments in some patches.
409	8	415	0	Fine even grained light grey mudstone.
415	0	426	0	Medium to coarse grained feldspathic sandstone with thin coal seams and lenses up to $\frac{1}{8}$".
426	0	432	0	Rock weathered. Mudstone and feld. sandstone fragments in clay.
432	0	458	8	Feldspathic sandstone and some siltstone with coal seams and lenses up to $\frac{3}{8}$". The thicker seams ($\frac{1}{8}$") are mostly more than 3" apart, whereas the thin seams are often very close (spacing to 1/16") Banded sandstone.
458	8	460	6	Very fine brownish-grey mudstone which grades into the coal.
460	6	468	2	Black homogeneous coal seam of fairly low quality.
467	0	467	6	Coal is broken and there are thin clay beds up to $\frac{1}{4}$".
468	2	479	6'	Alternating beds of carbonaceous sediments and non-carbonaceous mudstone and sandstones The coal beds become less carbonaceous downwards.
479	6	479	9	3" rock fragments and clay.
479	9	509	0	Light grey fine grained mudstone. Some thin carbonaceous lenses between 487' and 490'. Most breaks in the core are drilling breaks parallel to the bedding.
509	0	526	4	Massive feldspathic sandstone with thinly bedded, closely spaced black carbonaceous layers. Jointing sub-vertical. Coal lenses up to $\frac{1}{8}$" at 526'.
526	2	529	9	Alternating fine grained grey mudstone and coal. Coal becomes more vitreous and broken towards 529'.
529	9	535	3	Green clay.
535	3	541	0	Severely broken vitreous coal grading

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL - HOLE CI

ft.	in.	ft.	in.	Remarks
				(cont'd)
535	3	541	0	into carbonaceous mudstone at 541'
541	0	547	0	Mudstone with thin clay beds brecciated and decomposed to clay and rock fragments in patches.
547	0	558	7	Fine grained light greycross-bedded mudstone.
558	7	611	3	Medium grained massive feldspathic sandstone. Coaly lenses and seams up to $\frac{1}{4}$" are common from 577'-580'.
611	3	614	4	Grey mudstone.
614	4	619	9	Greenish - grey mudstone, with alterhating bands of black slightly carbonaceous mudstone. Average thickness of bands is $\frac{1}{8}$"
				616'-616'8" Region of slickensided and sheared mudstone.
619	9	620	2	Brown slightly weathered mudstone.
620	2	624	3	Carbonaceous mudstone with slickensides at 622'
624	3	628	4	Coal with closely spaced vitreous layers up to $\frac{1}{8}$" thick. 1" mudstone beds at 624'7" (weathered) and one at 625'1". No vitreous layers below 627'8" and from here it grades into a carbonaceous mudstone at 628'6".
628'	6"	634	11'	Grey mudstone with some slickensides.
634	11	709	8	Fine to coarse grained feldspathic sandstone with sets of thin coaly lenses at 646'6", 654', 662', 668', 678'4", 685'9", 706' and 709'. The sets are up to 1ft. long and consist of thin (up to $\frac{1}{8}$") coal lenses with an average spacing of $\frac{1}{4}$".
709	8	712	0	Black coal with vitreous layers up to $\frac{1}{8}$" Broken from 710'6" to 711'8" - 40% core loss.
712	0	713	5	Grey weathered mudstone consisting of rock fragments and clay.
713	5	719	10	Fairly uniform dark grey carbonaceous mudstone. Broken core due to fretting.
719	10	724	10	Carbonaceous sandstone containing thin wavy lenses of carb. material up to 1/16" and some mud. beds with gradational contacts.
724	10	753	6	Massive feldspathic sandstone medium to coarse grained with coal lenses up to $\frac{1}{8}$" at 735'10", 736'10", 738'1".
753	6	754	7	Grey banded carbonaceous mudstone.
754	7	755	9	Dull coal with vitreous bands up to 1/16".
755	9	756	7	Dark grey carbonaceous mudstone

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - EINGAL - HOLE CI

ft.	in.	ft.	in.	Remarks
756	7	759	4	Grey weathered and decomposed carbonaceous mudstone with closely spaced fissile partings.
759	4	760	11	Carbonaceous mudstone.
760	11	761	4	Coal with vitreous layers up to ½". Vertical gypsum veins.
761	4	782	1	Light grey slightly carbonaceous mudstone due to scattered vegetable matter; No coal lenses.
782	1	784	6	Dark grey carbonaceous mudstone containing 3" coal.
784	6	786	4	Dull coal with irregular vitreous layers.
786	4	788	4	Carbonaceous mudstone.
788	4	790	9	Coal with mudstone beds at 788'6" and 790'5".
790	9	809	7	Grey mudstone which grades from carbonaceous to slightly carbonaceous at the base.
809	7	850	0	Fine to medium grained feldspathic sandstone, with thin coal lenses.
850	0	853	3	Grey mudstone, only slightly carbonaceous.
853	3	853	4	Muddy coal with very thin vitreous layers.
				2" mudstone.
853	4	870	9	Fine to medium grained feldspathic sandstone.
				Weathered from 861'6" to 864'7". 857'9" - 1" thick set of thin carb. layers.
870	9	872	0	Grey mudstone becoming carbonaceous at 872'. Joints slickensided.

Hole stopped at 872'.

Logged by I. Munro & D. Furber

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - EINGAL - HOLE C2

ft.	in.	ft.	in.	Remarks
0	0	13	11	Mudstone weathered to greenish grey clay.
13	11	15	2	Grey massive mudstone.
15	2	17	0	Partly weathered grey siltstone.
17	0	21	6	Weathered, jointed feldspathic sandstone with limonite staining.
21	6	54	7	Brown to grey, medium to coarse grained feldspathic sandstone. 24'3" - 25'0" Cavities left by leached coal seams up to $\frac{1}{8}$" wide. Clay pellet conglomerate phases as shown. 35'0" - 46'6" Coal lenses up to $\frac{1}{8}$" are spaced from $\frac{1}{4}$" to 12".
54	7	60	0	Dark grey, slightly carbonaceous mudstone with some thin vitreous coal lenses up to $\frac{1}{2}$". One 1" band of dull coal at 59'9".
60	0	62	7	Mudstone with dull coal bands up to 3".
62	7	63	5	Dull, jointed and broken coal with thin vertical gypsum veins and some pyrite.
63	5	64	1	Weathered mudstone.
64	1	64	7	Dull coal
64	7	66	7	Mudstone containing small ($< \frac{1}{4}$") carbonaceous pellets.
66	7	69	9	Dull and vitreous coal with mudstone bands up to 4".
69	9	71	4	Carbonaceous mudstone with coal beds up to 1".
71	4	72	0	Dull coal with vitreous bands.
72	0	76	6	Carbonaceous mudstone
76	6	81	10	Dirty dull coal beds up to 8" interbedded with slightly weathered mudstone.
81	10	84	1	Slightly carbonaceous mudstone.
84	1	87	2	Pine grained feldspathic sandstone.
87	2	89	0	Mudstone and siltstone
89	10	126	10	Grey to brown medium grained feldspathic sandstone. A few very thin ($< 1/16$") coaly bands from 91'0" 92'6" Brown colour and slightly weathered from 99'6" to 110'0".
126	10	131	10	Grey siltstone.
131	10	132	8	Dull coal.
132	8	133	3	Partly weathered mudstone.
133	3	137	2	Coal with vitreous layers up to $\frac{1}{4}$". Thin gypsum veins and some pyrite on joints.
137	2	137	9	Weathered mudstone.

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL- HOLE C2.

ft.	in.	ft.	in.	Remarks
137	9	147	8	Coal with vitreous layers up to 1". Severely broken from 146'0" - 147'5". Some mudstone beds up to 3".
147'	8	160	10	Grey mudstone and siltstone.
160	10	169	3	Medium grained grey feldspathic sandstone. 1" of vitreous coal at 168'8".
169	3	171	0	Fihe grained grey mudstone.
171	0	171	5	Siltstone.
171	5	203	0	Medium grained feldspathic sandstone. 182'0" - 182'9" Vitreous coal lenses and bands up to $\frac{3}{4}$". 189'1" - 189'6" Broken mudstone due to fretting.
203	0	204	2	Carbonaceous mudstone.
204	2	206	0	Dull coal with vitreous bands up to $\frac{1}{8}$". Two 1" bands of clayey weathered carbonaceous mudstone at 204'5" and 205'3".
206	0	218	3	Sheared grey siltstone. Clay in the thicker joints.
218	3	220	8	Dull coal with some vitreous bands. 218'6" - 219'4" Brecciated band containing clay and broken coal.
220	8	222	6	Carbonaceous mudstone and siltstone.
222	6	268	10	Fine to medium grained feldspathic sandstone with some groups of thin impure coaly lenses.
268	10	273	10	Clay, feldspathic sand and sandstone fragments formed by decomposition of sandstone and mudstone. A slickensided surface at 268'10" has a 1" thick brecciated zone containing clay and sandstone fragments. Very stiff clay and mudstone fragments from 272'0" = 273'0". The whole interval is probably a fault zone.
273	10	275	9	Dull coal with vitreous layers up to $\frac{3}{8}$". Vertical gypsum veins up to 1/16" (30% core loss).
275	9	279	1	Mudstone with 2" clay at 276'8".
279	1	285	1	Sandy siltstone.
285	1	316	10	Medium to coarse grained feldspathic sandstone.
316	10	317	5	Broken, jointed, slickensided mudstone with sandstone lenses.
317	5	317	9	Feldspathic sandstone with irregular mudstone lenses up to 1" thick. Some lenses are carbonaceous.
317	9	329	9	Coarse siltstone to fine sandstone with small groups of very thin carbonaceous lenses.
329	9	330	3	Coal with vertical gypsum veins. $\frac{1}{2}$" brecciated clayey coal at 330'0".
330	3	341	6	Mudstone with many slickensided joints, some containing clay.

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVE[illegible]ONS - FINGAL - HOLE C2

Ft.	in.	ft.	in.	Remarks
341	6	344	0	Grey siltstone.
344	0	379	10	Medium to coarse grained feldspathic sandstone.
379	10	380	7	2" coal lens, 1" sandstone, 4" slickensided mudstone, 2" slickensided coal.
380	7	456	7	Medium to coarse grained feldspathic sandstone.
456	7	458	7	Carbonaceous siltstone.
458	7	460	0	Medium grained feldspathic sandstone with clay-pellet conglomerate phase. Pellets or lenses are carbonaceous and are up to 2" thick with most wider than ½".
460	0	484	11	Medium grained feldspathic sandstone with clay-pellet phases.
484	11	485	7	Feldspathic sandstone containing thick carbonaceous mudstone lenses and pellets.
485	7	488	6	Fine grained feldspathic sandstone.
488	6	489	9	Carbonaceous siltstone.
489	9	499	5	Banded fine grained sandstone to siltstone. Bands are carbonaceous beds up to 1" and some small lenses.
499	5	521	10	Mainly mudstone with some siltstone phases. Very carbonaceous from 504'8" to 505'7".
521	10	525	0	Dull coal with some vertical joints.
525	0	526	0	Carbonaceous mudstone.
526	0	533	3.	Dull coal with thin vertical gypsum veins.
533	3	561	9	Grey mudstone, banded in places due to thin siltstone phases. From 541'2" - 542 2" the rock is broken, partly weathered to clay and has slickensided joints.
561	9	563	10	Dull coal with vertical gypsum veins. Broken from 562' " to 563'0". 562'4"
563	10	569	5	Carbonaceous siltstone.
569	5	579	0	Fine to medium grained feldspathic sandstone.
579	0	579	4	Very carbonaceous mudstone with horizontal gypsum seams.
579	4	580	4	Completely weathered and broken muddy siltstone.
580	4	583	2	Fartly weathered siltstone, carbonaceous in some parts.
583	2	588	3	Fine grained siltstone.
588	3	595	2	Slightly carbonaceous mudstone, banded below 591"
595	2	596	3	Dull, fairly impure broken coal with

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATIONS - FINGAL - NOLE C2

ft.	in.	ft.	in.	Remarks
				(cont'd) slickensided joints.
596	3	602	6	Mudstone.
602	6	603	4	Dull coal with some thin vitinite layers. Partly broken.
603	4	607	0	Black, very carbonaceous mudstone. Density too high for coal.
607	0	615	6	Mudstone, banded in places, with carbonaceous mudstone and siltstone beds.
615	6	617	2	Partly broken dull coal with thin vitrinite layers. Vertically jointed.
617	2	624	11	Brown to grey fine grained mudstone or claystone. Decomposed to clayey silt from 618'2" - 618'10" and 621'2" - 621'6".
624	11	625	8	Dull coal with vitrinite bands up to ½".
625	8	632	10	Carbonaceous mudstone.
632	10	692	10	Pine to medium grained feldspathic sandstone. Some vitrinite lenses up to ½" from 279'6" - 281'3".
692	10	693	0	Carbonaceous mudstone
693	0	697	4	siltstone with some mudstone phases.
697	4	711	4	Medium grained feldspathic sandstone.
711	4	722	4	Mudstone with some siltstone.
722	4	725	10	Siltstone.
725	10	733	4	Mudstone with some siltstone phases. Partly sheared near 730'.
733	4	744	8	Coarse grained siltstone, banded with very thin carbonaceous bands from 740'-744'.
744	8	769	0	Mainly mudstone with thin beds of siltstone and coarse sandstone. Carbonaceous from 764'0".
769	0	805	1	Medium to coarse grained white, banded, sandy quartzite. Slightly feldspathic with many very thin, closely spaced carbonaceous bands. Some broken and partly weathered patches.
805	1	806	8	Pebble conglomerate containing rounded quartz pebbles and many clay pellet lenses. The Triassic - Permain boundary lies at 805'1" where the mudstone siltstone - feldspathic sandstone changes to a pebbly greywacke lithology.
806	8	821	0	Grey, sub-greywacke with a few very small white pebbles from 815'9" - 818'3" the rock is brecciated and weathered and probably represents a fault zone. The weathered rock consists of angular rock fragments in a black clayey matrix.

Hole completed at 821'0"

Logged by T. Munro

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - EINGAL - HOLE C3

ft.	in.	ft.	in.	Remarks
0		8	6	Scree.
8	6	18	6	Weathered mudstone with sandstone bands.
18	6	58	0	Weathered sandstone.
58	0	73	0	Fresh medium feldspathic sandstone with black streaks.clay pellet conglomerate at 72'.
73	0	94	0	Grey banded mudstone clear transition to coal at 94'.
94	0	97	10	Coal = Valley Mine Seam.
97	10	100	10	Mudstone with coaly bands.
100	10	103	0	Coal.
103	0	106	0	Weathered mudstone (seat earth)
106	p	113	6	Grey mudstone.
113	6	115	10	Coal.
115	10	121	0	Mudstone 2" coal at 117' and 6" coal at 120'.
121	0	122	0	Fine sandstone.
122	0	129	0	Banded mudstone with bands of sandstone increasing downwards.
129	0	151	0	Medium feldspathic sandstone.
151	0	170	0	Banded mudstone, darker downwards, thin coal 6" at 157', grain increases downwards in bands to medium feldspathic sandstone at 170'. Crystals of calcite at 170' in near vertical joint.
170	0	215	3	Medium feldspathic sandstone.
215	3	218	3	Coal: 1" coal to 215'4"; 2" band to 215'6"; 1" coal to 215'7"; ½" band to 215'7½".
218	3	229	0	Grey mudstone.
229	0	237	0	Dull coal, broken core.
237	0	252	0	Banded siltstone - mudstone with coarser sandstone beds.
252	0	257	7	Grey mudstone (fossils)
257	7	260	10	Broken coal.
260	10	270	10	Banded sandstone -siltstone and mudstone.
270	10	272	10	Coal.
272	10	275	0	Banded weathered sandstone.
275	0	281	0	Mudstone.
281	0	283	3	Coal
283	3	299	6	Grey banded mudstone.
299	6	302	0	Coal.
302	0	321	0	Banded siltstone, mudstone

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL C3.

ft.	in.	ft.	in.	Remarks
				(Cont'd) sandstone (coarsest near 310)
321	0	322	0	Coal grading down into coaly mudstones.
322	0	327	0	Coal grading down into coaly mudstones.
322	0	327	0	Black mudstones.
327	0	334	0	Grey mudstone.
334	0	387	0	Banded fossiliferous feldspathic sandstone to 340', then fossiliferous but fewer bands to cleaner 380'-381' coaly partings, bands, and finer sandstone banding.
387	0	406	0	Banded fine sandstone and siltstone.
406	0	429	0	Medium feldspathic sandstone clay pellets at 411'.
429	0	437	0	Fine and medium banded sandstone.
437	0	439	0	Medium sandstone.
439	0	448	10	Medium sandstone banding towards end.
448	10	458	0	Banded sandstone, coaly pellets at 450' for ½" and at 452' for 2¼".
458	0	466	0	Banded mudstone.
466	0	470	0	Banded mudstone, fine sandstone and siltstone.
470	0	475	0	Banded whitish sandstone, thin black bands and coal streaks.
475	0	494	0	Fine banded sandstone, fossiliferous, siltstone bands.
494	0	522	0	Medium grey sandstone quartzose becomes coarser downwards, black coaly partings throughout.
522	0	533	9	Fermian, pebbles to 1", plant fossils, mudstone dark grey to black.

Hole completed 533'9".

Logged by G.E. Hale

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL HOLE C4.

ft.	in.	ft.3	in.	Remarks
0	0	50	6	Scree.
51	0	55	6	Medium feldspathic sandstone.
53	6	57	6	Coal.
57	6	67	9	Banded sandstone and mudstone.
67	9	68	0	Coal (20% core loss)
68	0	77	7	Mudstone with thin coal bands.
77	7	80	1	Coal (20% core loss)
80	1	85	0	Mudstone with 3" coal.
85	0	94	0	Medium sandstone.
94	0	99	0	Mudstone.
99	0	101	7	Coal with mudstone bands.
101	7	102	7	Coarse sandstone.
102	7	110	0	Grey mudstone.
110	0	119	0	Medium grey sandstone.
119	0	121	0	Dark grey mudstone.
121	0	131	6	Banded sandstone and mudstone.
131	6	142	0	Dark grey mudstone.
142	0	190	0	Medium grey sandstone (feldspathic)
190	0	198	8	Grey mudstone
198	8	253	0	Grey medium feldspathic sandstone.
198	8	253	0	Medium grey feldspathic sandstone- clay pellets at 219'-221' and 244'-245'.
253	0	266	6	Medium sandstone.
266	6	282	0	Grey medium sandstone, banded.
282	0	290	0	Banded sandstone with 12" black mudstone at 284'
290	0	305	0	Finer sandstone with shale bands.
305	0	310	0	Carbonadeous mudstone and poor coal.
310	0	342	8	White quartzose sandstone. 311'5" Clay pellets. 311'9" 1"of coal. Permian at 342' dark grey mudstone with pebbles to ¼" diameter.

Hole completed at 397'3"

Logged by G.E. Hale

HYDRO ELFCTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL HOLE C5

ft.	in.	ft.	in.	Remarks
0	0	40	0	Scree - dolerite boulders.
40	0	43	0	Weathered grey mudstone.
43	0	51	0	Grsy mudstone with carbonaceous bands; 43'6" - 3" 45' - 2" 46' - 2"
51	0	52	0	Grey mudstone.
52	0	61	9	Fine medium banded feldspathic sandstone.
61	9	66	0	Banded mudstone (fossils)
66	0	67	6	Coal
67	6	83	3	Banded sandstone (calcarerous) near top, mudstone increases downwards, current bedded.
83	3	88	6	Fine banded sandstone.
88	6	94	2	Dull coal or black carbonaceous mudstone.
94	2	100	0	Black mudstone grading to banded sandstone.
100	0	102	8	Dark grey mudstone.
102	8	105	0	Banded mudstone and sandstone.
105	0	106	0	Dark grey mudstone.
106	0	112	8	Light grey banded mudstone and siltstone.
112	8	149	0	Light grey medium feldspathic sandstone.
149	161	161	0	Darker bands of siltstone in sandstone.
161	0	223	3	Fine sandstone increasing in coarseness downwards .clay pellet conglomerates at 190' - 194' 211' - 212'; 214' - 220' (very coarse).
223	0	223	3	Coal pellets and a few inches of mudstone penetrates into sandstone at 224'.
223	3	227	0	Fine sandstone.
227	0	232	0	Banded mudstone.
232	0	233	0	Fine sandstone.
233	0	237	0	Dark grey and banded carbonaceous mudstone.
237	0	249	0	Fine sandstone.
249	0	249	6	Coaly band.
249	6	267	0	White sandstone with black bnnds.
267	0	268	3	Black carbonaceous mudstone.
268	3	317	0	Light coloured quartzose sandstone - bands common below 281' 3" black band at 287'.
317'	0	329	11	Permian - dark grey mudstone with pebbles to ¼" diamenter, some bonding.

Hole completed 329'11"

Logged by G.E. Hale

HYRDO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL HOLE C6

Ft.	in.	ft.	in.	Remarks
0		34	0	Weathered mudstone.
28	0	29	0	Weathered coaly band.
34	0	41	6	Yellow weathered mudstone. 36'2"-39'8" broken carbonaceous bands.
41	6	54	6	Dark grey mudstone with some fine sandstone bands.
54	6	57	6	Coal broken for 1st foot.
57	6	63	0	Medium sandstone with thin carbonaceous bands.
63	0	67	0	Grey mudstone with sandstone bands.
67	0	68	8	Coal with ½" bands.
68	8	71	10	Grey soft siltstone with carbonaceous bands.
71	10	72	0	Coaly band.
72	0	75	0	Very broken mudstone with coaly bands.
75	0	80	8	Dark grey mudstone.
80	8	82	5	Coal.
82	5	86	6	Dark grey mudstone grading to sandstone.
86	6	90	0	Fine banded sandstone grading to mudstone.
90	0	94	5	Mudstone with siltstone bands.
94	5	98	0	Coal - 1" band at 97'.
98	0	100	0	Banded mudstone faulted at 60° against sandstone.
100	0	102	10	Medium feldspathic sandstone.
102	10	110	6	Mudstone grading to coal.
110	6	113	0	Coal grades to dark grey mudstone.
113	0	146	0	Dark grey mudstone - breaks easily. (125'-130').
				More silty and lighter colour.
146	0	190	3	Dark grey feldspathic sandstone.
				Clay pellet conglomerate at 147'-151' and at 188'.
190	3	192	4	Banded sandstone and mudstone.
192	0	203	0	Bands of sandstone increase downwards.
203	0	216	3	Medium uniform feldspathic sandstone.
216	3	221	4	Mudstone.
221	4	221	9	Fine sandstone.
221	9	227	3	Dark grey mudstone.
227	3	245	0	Banded sandstone with bands decreasing from 232'2".
245	0	247	0	Medium feldspathic sandstone grades to banded sandstone.

HYDRO ELECTIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL HOLE C6

ft.	in.	ft.	in.	Remarks
247		251	4	Banded sandstone and thin mudstone.
251	4	252	0	Dark grey mudstone.
252	0	265	7	Mudstone with thin sandstone bands.
265	7	314	9	Medium quartzose sandstone with black coaly streaks, some pyrite.
				1" of coal at 314'8".
314	9	316	9	Dark grey mudstone.
316	9	330	0	Coarse quartzose sandstone.
330	0	342	0	Permian greywacke sandstone 4½" Quartzose bands at 330'11" and 1" at 331'2".

Hole completed at 342ft. oins.
Logged by G.E. Hale

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - EINGAL - HOLE C7

Et.	in.	ft.	in.	Remarks
0	0	13	0	Weathered yellowish mudstone.
13	0	16	0	Weathered brown medium feldspathic sandstone.
16	0	30	10	Dark grey mudstone.
30	10	33	0	Brown medium sandstone with black bands.
33	0	34	0	Black mudstone, 3" brown sandstone.
34	3	45	0	Grey and brown weathered mudstone with coaly intrusions at base.
45	0	46	0	Broken coal.
46	0	54	0	Medium feldspathic sandstone.
54	0	58	0	Mudstone.
58	0	66	0	Coal.
66	0	67	0	Grey mudstone.
67	0	69	0	Feldspathic sandstone.
69	0	72	2	Grey mudstone, 2" coal at bottom.
72	2	72	8	Grey mudstone.
72	8	78	0	Coal. 1½" band at 73' and ½" clay at 77'6".
78	0	97	0	Banded sandstone and siltstone.
97	0	102	0	Grey mudstone banded in part.
102	0	105	0	Coal.
105	0	107	0	Banded black siltstone - claystone.
107	0	110	0	Banded feldspathic sandstone - pellets at 110'.
110	0	116	0	Medium feldspathic sandstone.
116	0	117	0	Coal (broken).
117	0	118	0	Sandstone.
118	0	121	0	Banded mudstone.
121	0	122	0	Broken coal.
122	0	129	6	Dark grey mudstone.
129	6	131	6	Poor coal.
131	6	141	0	Grey mudstone.
141	0	145	0	Coal.
145	0	147	0	Grey mudstone.
147	0	150	0	Banded sandstone - mudstone.
150	0	173	0	Banded mudstone, 6" coal at 152'.
173	0	215	0	Medium feldspathic sandstone.
215	0	217	0	Carbonaceous material - calcareous and clay pellets.
217	0	232	0	Medium feldspathic sandstone - clay pellets at 230'.

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - EINGAL - HOLE C7

ft.	in.	ft.	in.	Remarks
232	0	236	0	Banded sandstone - mudstone becomes finer to siltstone between 236' and 237'.
237	0	239	0	Banded fine siltstone.
239	0	240	0	Banded mudstone becomes coarser between 240'-245'.
245	0	272	6	Medium feldspathic sandstone.
272	6	276	0	Banded mudstone grades to
276	0	290	0	Banded sandstone and siltstone, mudstone band 283'-284'.
290	0	312	6	Banded siltstone.
312	6	314	8	Calcareous medium feldspathic sandstone.
314	8	319	0	Black mudstone - slickensides at 316'
319	0	369	0	Quartzose sandstone with blacksands and coaly streaks, very coarse sandstone at 367'.
369	0			Coarse quartzose sandstone.
369	0	386	3	Dark grey Permian mudstone - plant fossils pebbles to ¼" diameter.

Hole completed at 386ft. 3 ins.

Logged by G.E. Hale

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL - HOLE C8

ft.	in.	ft.	in.	Remarks
0	0	273	9	Talus and scree - dolerite boulders, sand and clay.
275	9	285	0	Grey mudstone - no baking
285	0	291	0	Dark grey to black carbonaceous mudstone.
291	0	335	0	Grey banded mudstone.
				Black Colour from 304' to 320'.
335	0	387	0	Grey feldspathic sandstone.
387	0	452	0	Banded sandstones, mudstones.
				Clay pellets at 407' for 18"
				Black band at 421'.
452	0	458	0	Fine grey feldspathic sandstone with finer and darker bands towards bottom.
458	0	458	6	Eine grey quartzose sandstone.
458	6	471	0	Dark grey banded mudstone carbonaceous for bottom 2'.
471	0	491	9	Medium white quartzose sandstone.
491	9	494	6	Coarse quartzose sandstone.
494	6	511	0	Medium white quartzose sandstone.
511	0	521	10	Dark grey Permian mudstones with pebbles to ¼" diameter.

Hole completed at 521ft. 10 ins.

Logged by G.E. Hale

HYDRO ELECTRIC COMMISSION

COAL RESOURCES INVESTIGATION - FINGAL - HOLE C9

ft.	in.	ft.	in.	Remarks
				Scree and sand.
0	0	125	2	Scree and sand.
132	0	139	0	Weathered coal and mudstone.
139	0	148	0	Banded mudstone.
148	0	149	0	Broken coal.
149	0	159	0	Grey mudstone.
159	0	166	0	Coal, 2'11" loss.
166	0	169	0	Banded sandstone and siltstone.
169	0	176	1	Grey mudstone, 3" carbonaceous at 175', 1" grey sandstone at 176'.
176	1	179	9	Brown mudstone.
179	9	187	2	Black carbonaceous mudstone and dull coal.
187	2	191	8	Dark grey mudstone.
191	8	247	2	Medium grey feldspathic sandstone.
				Grey feldspathic sandstone, clay pellets at 229'.
				Coal and mudstone fragments at 245' and 247'2".
247	2	249	0	dark grey mudstone.
249	0	249	6	Sandstone.
249	0	252	0	Banded sandstone and mudstone.
252	0	300	0	Banded fine feldspathic sandstone and siltstone with some coarser bands.
[illegible]				Carbonaceous band, at 292'2"
300	0	307	0	Medium feldspathic sandstone.
307	0	321	0	Banded sandstone - siltstone 3" carbonaceous band at 319'.
321	0	343	0	Grey feldspathic sandstone banded near 343'.
343	0	363	10	Quartzose sandstone with black streaks coarser towards top and bottom, pellets near bottom.
368	10	385	3	Permian dark grey mudstone with small pebbles.

Hole completed at 385ft.3ins.

Logged by G.E. Hale.

CORNWALL COLLIERY, CORNWALL - HOLE No. 1

ft.	in.	ft.	in.	Remarks
0	0	5	0	Talus.
5	0	6	0	Weathered sandstone.
6	0	27	0	Medium to light grey siltstones and mudstones.
27	0	30	0	Dark grey to black mudstone.
30	0	34	0	Medium grey siltstone.
34	0	35	0	Dark grey to black mudstone.
35	0	35	6	Black siltstone
35	6	38	0	Dark grey to black mudstone
38	0	39	6	Medium grey siltstone; dip 6°.
39	6	42	0	Laminated black carbonaceous mudstone.
42	0	43	0	Black shale (clod).
43	0	44	0	Black siltstone; dip 5°.
44	0	45	0	Black cherty siltstone.
45	0	52	0	Soft, dark grey friable siltstone.
52	0	53	6	Hard, dark grey silty chert.
53	6	55	6	Soft, black friable siltstone.
55	6	58	6	Hard, black and dark grey silty chert.
58	6	59	6	Light grey fine-grained lithic sandstone.
59	6	61	6	Driller recorded poor coal. Core removed by Mines Department.
61	6	62	6	Light grey fine-grained sandstone.
62	6	65	6	Driller recorded: 11" coal 1" band, 24" coal. Core removed by Mines Department.
65	6	66	6	Soft weathered, light greenish-grey siltstone.
66	6	68	0	Hard, medium grey cherty siltstone.
68	0	68	6	Soft, weathered, light greenish-grey siltstone.
68	6	69	6	Hard black silty chert.
69	6	71	6	Soft, weathered, light grey siltstone.
71	6	76	0	Driller recorded: poor quality:coal. Core removed by Mines Department.
76	0	77	0	Hard, black and medium grey cherty siltstone.
77	0	79	6	Soft, weathered, light grey siltstone and fine grained sandstone.
79	6	87	6	Driller recorded: (2'2" coal (white band Core removed by Mines Department. (4'6" Dirty coal with (stone bands.
87	6	88	0	Soft, weathered, greenish-grey fine-grained sandstone.

CORNWALL COLLIERY, CORNWALL - HOLE No. 1

ft.	in.	ft.	in.	Remarks
88	0	90	0	Hard black carbonaceous shale (clod).
90	0	91	0	Soft weathered light greenish-grey siltstone.
91	0	95	0	Soft, black friable siltstone.
95	0	97	0	Hard, black carbonaceous shale (clod).
97	0	98	0	Hard, medium grey cherty siltstone.
98	0	99	0	Soft, weathered, light greenish-grey siltstone.
99	0	101	0	Hard black cherty siltstone.
101	0	102	0	Soft, weathered light and medium grey siltstone.
102	0	106	6	Medium hard, black cherty siltstone.
106	6	112	0	Light medium-grey laminated carbonaceous siltstone. dip 3°: 3" coal.
112	0	124	6	Light grey, fine-grained, lithic sandstone with carbonaceous laminations.
124	6	128	0	Black carbonaceous shale (clod.)
128	0	129	6	Black sandy siltstone
129	6	130	6	Weathered greenish-grey claystone.
130	6	133	0	Medium hard, black silty mudstone.
133	0	134	0	Soft, weathered, light greenish-grey sandstone.
134	0			6" coal.
134	6	141	0	Black carbonaceous shale (clod); friable dip 10°.
141	6	142	0	Medium grey siltstone.
142	0	147	0	Light grey fine-grained sandstone; dip 6°.
147	0	196	0	Light grey medium-grained lithic sandstone; few carbonaceous and coal laminations; dip 10°.
188	0			3" coal.
194	0	196	0	Prominent carbonaceous layering, coal lenses.
196	0	202	0	Light grey and medium grey carbonaceous silty mudstone.
202	0	210	6	Light grey medium-grained sandstone with clay pellets.
205	6			6" black siliceous mudstone.
210	6	211	0	Light grey siltstone; dip 12°.
211	0	238	0	Light grey medium grained lithic sandstone.
225	6	228	0	carbonaceous and coaly layering; friable; soft; dip 10°.
238	0	245	0	Light grey fine-grained lithic sandstone.
245	0	253	0	Light grey medium-grained lithic sandstone.
253	0	256	0	Light grey fine-grained lithic sandstone.
255	6	256	0	Numerous fine carbonaceous laminations.

CORNWALL COLLIERY, CORNWALL - HOLE No. 1

ft.	in.	ft.	in.	Remarks
256	0	280	0	Light grey medium-grained sandstone; some carbonaceous laminations and mudstone pellets.
280	0	284	6	Light grey fine-grained lithic sandstone.
283	6			1½" contorted coal layer.
284	6	289	0	Medium-grey siltstone (broken pieces).
289	0	290	6	Light grey coarse-grained lithic sandstone.
290	6	317	0	Light grey medium-grained lithic sandstone with coal lenses and siltstone partings; dip to 20°.
317	0	320	0	Light grey fine-grained lithic sandstone.
320	0	324	0	Light grey medium-grained lithic sandstone.
324	0	324	6	Light grey coarse-grained sandstone; with siltstone pebbles up to 1" diameter.
324	6	337	0	Light grey fine-grained lithic sandstone.
337	0	343	6	Light grey medium-grained lithic sandstone, few carbonaceous laminations.
343	6	346	6	Driller recorded: (1'7" coal / mudstone and coal / 2" coal / mudstone / 5" coal) Core removed by Mines Department.
346	6	347	6	Medium grey mudstone.
347	6	350	0	Medium grey laminated siltstone; dip up to 10°.
350	0	353	0	Black silty mudstone; friable.
353	0			10" coal.
354	0	361	6	Medium grey laminated siltstone.
361	6	365	0	Black silty mudstone; friable.
365	0	376	0	Laminated medium to light grey siltstone and light grey sandstone; dip up to 15°.
376	0	3779	6	Black carbonaceous shale (clod).
377	6			Driller recorded: 2'9" coal: Core removed by Mines Dept.
380	0	383	0	Dark grey silty mudstone.
383	0	385	0	Light grey siltstone and fine sandstone.
385	0	388	0	Dark grey silty mudstone.
388	0	391	0	Driller recorded: 3' coal: Core removed by Mines Dept.
391	0	393	0	Black carbonaceous shale; friable.
393	0	404	0	Medium grey siltstone and silty mudstone: dip up to 10°.

CORNWALL COLLIERY, CORNWALL - HOLE NO. 1

ft.	in.	ft.	in.	Remarks
404	0	406	6	Driller recorded 2'6" Coal: Core removed by Mines Department.
406	6	408	0	Dark grey siltstone; some carbonaceous laminations.
408	0	417	0	Light grey fine to medium-grained lithic sandstone.
417'	0	423	0	Light grey medium-grained lithic sandstone; some carbonaceous layering.
423	0	426	0	Light grey fine-grained sandstone.
426	0	477	0	Light grey medium-grained lithic sandstone; few carbonaceous laminations; dip up to 10°.
434	0			1/3" coal lense and clay pellets.
451	0			2" Black carbonaceous shale (clod).
455	0	456	0	Noticeably calcareous.
477	0	477	6	Irregular sandstone and mudstone; some slickensides.
477	6	479	0	Light grey fine-grained lithic sandstone.
479	0	480	0	Irregular sandstone and mudstone with carbonaceous layering.
480	0	481	0	Dark grey silty mudstone.
481	0	481	6	Irregular sandstone and mudstone; dip to 30°.
481	6	485	0	Light grey fine-grained lithic sandstone.
485	0	486	6	Black carbonaceous shale (clod) and slickensided mudstone.
486	6	490	0	Light grey fine-grained sandstone with up to ½" carbonaceous and coal laminations.
490	0	493	0	Dark grey silty mudstone.
491	6			Slickensides.
493	0	498	0	Interbedded light grey and medium grey siltstone and fine-grained sandstone.
498	0	509	0	Interbedded light grey siltstone and mudstone.
509	0	518	0	Medium grey silty mudstone; laminated at base; dip 8°.
518	0	521	0	Light grey medium-grained lithic sandstone; crumbly.
521	0	524	6	Driller recorded 2'9" coal; Core removed by Mines Department.
524	6	534	0	Medium grey laminated siltstone.
534	0	535	0	Medium grey silty mudstone with 2" black carbonaceous shale (clod).
535	0	537	0	Medium grey siltstone with ⅛"-¼" carbonaceous laminations at base.
537	0	537	6	Medium grey siltstone.
537	6	538	6	Black carbonaceous shale (clod).
538	6	544	0	Driller recordod; [illegible]

CORNWALL COLLIERY, CORNWALL - HOLE NO. 1

ft.	in.	ft.	in.	Remarks
				1'2" coal and 2" band. 3'2" coal and band. 9" coal Core removed by Mines Department.
544	0	547	0	Light grey fine-grained lithic sandstone.
547	0	551	6	Dark grey silty mudstone.
551	6	552	0	Black carbonaceous shale.
552	0	558	0	Interbedded light grey fine to medium-grained lithic sandstone.
558	0	561	0	Light grey fine-grained lithic sandstone.
561	0	562	0	Dark grey mudstone and black carbonaceous shale.
562	0	565	6	Driller recorded; 2'8" coal Brown band Coal Core removed by Mines Department.
565	6	579	0	Interbedded medium grey siltstone and fine sandstone.
571	0			½" coal.
579	0	580	6	Black carbonaceous shale (clod).
580	6	582	6	Medium grey fine-grained lithic sandstone with numerous carbonaceous laminations; crumbly.
582	6	586	0	Black carbonaceous shale (clod).
586	0	587	0	Light greenish-grey and dark grey laminated silty mudstones; crumbly.
587	0	589	0	Black carbonaceous shale (clod).
589	0	594	9	Driller recorded: 10" Coal 4" Black stone + ½" white band. 4'00" Coal 3'00" Banded coal.
594	9	600	0	Laminated dark grey mudstone and medium grey siltstone.
600	0	603	0	Light grey fine-grained lithic sandstone.
603	0	605	0	Dark grey silty mudstone.
				Hole Completed 605'.
				Logged by S.J. Paterson.
				6-10-1959.

CORNWALL COLLIERY, CORNWALL - HOLE NO. 2.

ft.	in.	ft.	in.	Remarks	Sample No.
0	0	102	6	Clay and boulders. (Drillers comment).	
102	6	103	0	Light grey medium-grained sandstone.	
103	0	104	6	Light grey to medium grey laminated siltstone and mudstone.	
104	6	105	0	Light grey fine grained sandstone.	
105	0	108	0	Medium grey siltstone; friable - core broken.	
108	0	112	0	Laminated black, medium and light grey siltstone; Dip 5°.	
112	0	113	0	Laminated light grey fine sandstone and siltstone.	
113	0	114	6	Black shale (clod)	
114	6	116	0	Light grey silty mudstone.	
116	0	121	0	Laminated light, medium and dark grey, white and black siltstone; 3½"-4" laminations; Dip 5°.	
121	0	125	0	White siltstone with bands of black siltstone; calcareous; dip 5°.	
125	0	126	0	Black shale with white siltstone bands.	
126	0	130	0	Medium grey siltstone.	
130	0	132	0	Core removed by Mines Department. Driller recorded light and dark mudstone.	
132	0	135	0	Core removed by Mines Department; Driller recorded black shale (clod).	
135	0	137	0	Laminated light grey fine-grained sandstone and siltstone.	
137	0	137	6	Medium grey mudstone.	
137	6	139	0	Black shale (clod).	3A
139	0	140	0	Light grey mudstone.	
140	0	143	6	Core removed by Mines Department. Driller recorded poor coal with grey band.	4
143	0	145	0	Light grey mudstone with black shale.	
145	0	146	0	Core removed by Mines Department. Driller recorded coal.	
146	0	147	6	Light grey mudstone.	
147	0	149	6	Core removed by Mines Department. Driller recorded coal.	
149	6	150	0	Medium grey mudstone.	
150	0	156	0	Core removed by Mines Department. Driller recorded coal with white bands.	6
156	0	157	0	Medium grey silty mudstone and black shale.	
157	0	161	0	Core removed by Mines Department. Driller recorded poor quality coal with numerous bands (⅛"-4") and some black shale (clod).	
161	0	161	6	Medium grey siltstone.	
161	6	164	0	Core removed by Mines Department. Driller recorded poor quality coal with numerous bands (⅛"-4") and some black shale (clod).	
164	0	165	0	Medium grey mudstone and black shale.	

CORNWALL COLLIERY, CORNWALL - HOLE NO. 2.

ft.	in.	ft.	in.	Remarks
165	0	165	6	Coal.
165	6	166	0	Medium grey silty mudstone.
166	0	176	0	Core removed by Mines Department. Driller recorded dirty coal with mudstone and black shale bands.
176	0	187	0	Medium grey laminated siltstone and mudstone; Dip 5°.
179	0			4" Coal and black shale.
187	0	189	0	Light grey fine-grained lithic sandstone with carbonaceous laminae.
189	0	191	0	Laminated light, medium and dark grey siltstone, mudstone and sandstone.
191	0	193	0	Core removed by Mines Department. Driller recorded dark shale.
193	0	195	6	Interbedded light grey silty mudstone and black shale.
195	6	197	6	Core removed by Mines Department. Driller recorded thin coal seams.
197	6	199	0	Black shale.
199	0	200	0	Light grey silty mudstone.
200	0	201	0	Core removed by Mines Department. Driller recorded black shale (clod).
201	0	202	0	Light grey silty mudstone and sandstone + clay pellets.
202	0	205	0	Core removed by Mines Department. Driller recorded black shale (clod).
205	0	206	0	Light grey mudstone.
206	0	209	0	Core removed by Mines Department. Driller recorded coal and black shale (clod).
209	0	211	0	Dark to medium grey carbonaceous mudstone.
211	0	216	0	Medium to dark grey, laminated, fine-grained lithic sandstone.
216	0	259	0	Light greenish-grey medium to fine-grained lithic sandstone with carbonaceous and coaly partings.
254	0			Siltstone layer; dip 5°.
259	0	260	0	Small paraconformity; clay pellets and coaly partings.
260	0	275	0	Light greenish-grey medium to fine-grained lithic sandstone.
272	6			Coal parting.
273	6			3" Black shale.
275	0	276	6	Black shale (clod).
277	0			Small paraconformity; 2" coal; clay pellets.
277	0	282	0	Light greenish-grey medium to fine-grained lithic sandstone.
282	0	298	0	Core not available - Driller recorded sandstone.
298	0	299	0	Light grey medium grained lithic sandstone with numerous irregular coaly partings.

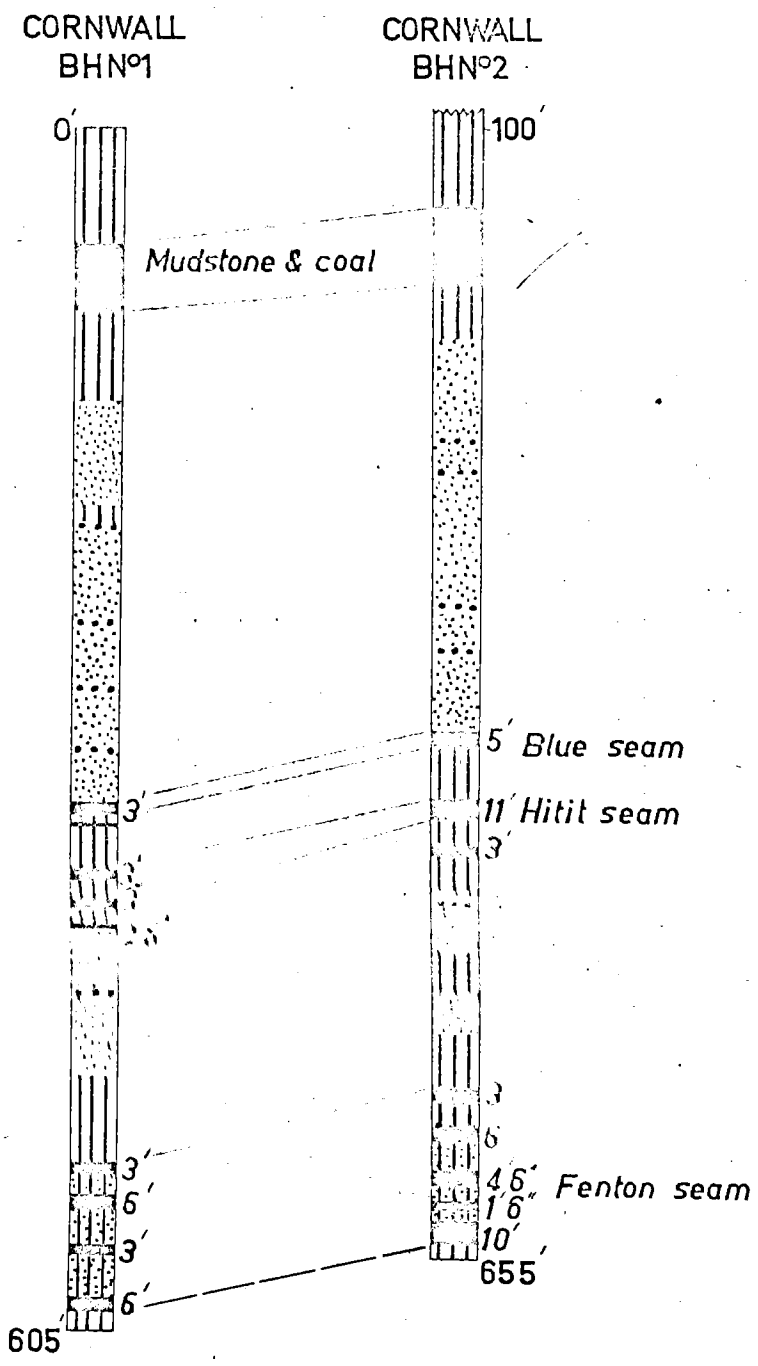
ft.	in.	ft.	in.	Remarks	Sample No.
299	0	300	0	Medium grey siltstone - calcareous; small paraconformity.	
300	0	332	0	Light greenish-grey medium-grained lithic sandstone.	
327	0			¼" calcite vein.	
331	0			Coal parting.	
332	0			3" coal.	
332	6	338	0	Laminated medium-grey siltstone and dark grey mudstone.	
338	0	358	6	Light greenish-grey medium-grained sandstone with some carbonaceous layers and clay pellets (up to 1")	
341	0	342	0	Weathered zone; soft yellow brown.	
347	6	348	0	Weathered zone; soft yellowish-brown.	
350	0	350	6	Weathered zone; soft yellowish-brown.	
358	6	359	6	Medium to dark-grey laminated sandstone; small angular unconformity at base; dip 22°.	
359	6	367	0	Light greenish-grey medium-grained lithic sandstone with ½" clay pellets and ¼" clay bands.	
367	0	368	0	Medium grey siltstone.	
368	0	401	6	Light greenish-grey medium-grained lithic sandstone.	
368	0	376	0	Weathered zone; soft yellowish-brown.	
377	0	382	0	Weathered zone; soft yellowish-brown.	
390	0	396	0	Weathered zone; soft yellowish-brown.	
396	0	401	6	Light grey medium-grained lithic sandstone.	
401	6	402	6	Light grey fine-grained lithic sandstone.	
402	6	406	0	Medium grey laminated siltstone.	
406	0	409	0	Core removed by Mines Department. Driller recorded coal.	21A
409	0	409	6	Dark grey mudstone.	
409	6	411	6	Coal with 7" mudstone band. Core removed by Mines Department.	21B
411	6	415	0	Medium grey laminated siltstone; dip 10°.	
415	6	416	6	Coal with 1" white bands; Core removed by Mines Department.	
416	6	434	0	Interbedded dark grey mudstone, medium grey siltstone and light grey fine-grained lithic sandstone; dips up to 15°.	
434	0	434	6	Light grey fine-grained lithic sandstone.	
434	6	435	6	Dark grey siltstone.	
435	6	439	0	Light grey fine-grained lithic sandstone with carbonaceous partings.	
439	0	450	0	9" coal 7" black shale 2'6" coal 11" white mudstone 9" coal 1" white band 5'8" coal Core removed by Mines Department.	Sample No. 25A " " 26A " " 27

CORNWALL COLLIERY, CORNWALL - HOLE NO. 2.

FT.	in.	ft.	in.	Remarks	Sample No.
450	0	459	0	Dark grey laminated mudstone.	
451	0			½" coal parting.	
459	0	461	0	Medium grey siltstone with 1/16"-¼" mudstone laminations.	
461	0	462	0	Dark grey laminated siltstone; dip 10°.	
462	0	465	0	3" coal 2" grey band 2" coal ½" brown coal 2'6" coal (Core removed by Mines Department.)	28.
465	0	466	0	Dark grey laminated silty mudstone.	
466	0	473	0	Light greenish grey medium-grained sandstone; some silty layers; dip 10°.	
473	0	476	0	Broken slickensided mudstone; Fault zone.	
476	0	512	0	Light greenish-grey speckled medium-grained lithic sandstone; some carbonaceous layering.	
484	6			⅛" coal parting, dip 6°.	
497	0			¼" coal parting; clay pellets; dip 6°.	
500	0			Soft, friable.	
510	0	512	0	Soft, friable.	
512	0	516	0	Dark grey carbonaceous mudstone.	
516	0	517	0	Soft, light grey siltstone; friable; powders easily.	
517	0	518	0	Dark grey mudstone.	
518	0	523	0	Medium grey siltstone.	
523	0	525	6	Dark grey mudstone.	
525	6	530	6	Interbedded medium grey, medium to fine lithic sandstone, siltstone and mudstone; dip 20°.	
530	6	531	6	Medium grey fine grained lithic sandstone.	
531	6	552	0	Light greenish grey medium grained lithic sandstone; ½" carbonaceous layer at 334'; dip 10°.	
552	0	553	6	4" coal and light grey fine-grained lithic sandstone.	
553	6	557	0	Medium grey siltstone.	
557	0	558	6	Dark grey mudstone.	
558	6			Fault, dip 45°; slickensides.	
558	6	559	0	Light grey fine-grained sandstone, Dip 2°.	
559	0	562	0	Dark grey siltstone.	
562	0	566	0	Dark grey laminated carbonaceous mudstone; silty at base.	
566	0	571	0	Dark grey fine-grained sandstone with some carbonaceous laminae.	
571	0	571	6	Light grey medium-grained sandstone with clay pellets.	
571	6	573	6	Lark grey sparsely laminated mudstone.	
573	6	574	6	Medium grey fine-grained lithic sandstone.	

CORNWALL COLLIERY, CORNWALL - HOLE NO. 2.

ft.	in.	ft.	in.	Remarks	Sample No.
574	6	576	6	Dark grey laminated siltstone.	
576	6	578	0	Medium grey fine-grained lithic sandstone.	
578	0	579	0	Dark grey laminated siltstone.	
579	0	582	6	Coal. (Core removed by Mines Department.)	29
582	6	587	0	Medium-grey carbonaceous siltstone.	
587	0	590	0	Dark grey carbonaceous mudstone; dip 10°.	
590	0	593	0	Dark grey carbonaceous siltstone.	
593	0	598	0	Medium grey fine-grained carbonaceous lithic sandstone.	
598	0	604	6	2'3" coal 4" white clay 2" coal 3" band 1'4" coal 1" brown band 1'10" coal (Core removed by Mines Department.)	30
604	6	609	0	Light greenish-grey sandstone with carbonaceous laminae; dip 8°.	
609	0	615	6	Dark grey to black carbonaceous mudstone; dip 4°.	
615	6	619	6	Light greenish-grey fine-grained lithic sandstone; dip 6°.	
619	6	620	0	Dark grey mudstone.	
620	0	625	0	I'll" coal 2" hard white band 2'6" coal (Core removed by Mines Department.)	31
625	0	626	0	Dark grey mudstone; horizontal dip.	
626	0	638	0	Light greenish-grey, medium-grained lithic sandstone; few 1/16" carbonaceous laminae; dip 4°.	
636	0			1' light fawn-blue-grey medium-grained lithic sandstone.	
638	0	639	6	Poor coal. (Core removed by Mines Dept.)	32
639	6	642	0	Laminated carbonaceous mudstone and siltstone. 639' - ½" calcite vein.	
642	0			2" coal.	
642	0	644	0	Dark grey fine-grained carbonaceous sandstone.	
644	0	654	6	1'2" coal ½" grey band 2" coal 1" grey band 4" coal 1" stone band 11" coal 11" coal, mudstone, sandstone band. 10" coal 3" stone band 4'9" coal (Core removed by Mines Department.)	33
654	0	655	0	Dark grey carbonaceous mudstone. Hole completed 655'. Logged by S.J. Paterson. 6-10-1959.	



BOREHOLE LOGS
CORNWALL N°1 & 2

Analyses of Samples of Coal from Cornwall No. 2 Bore (1957)

Registered No.	Sample No.	Position	Moisture	V.C.M.	Fixed Carbon	Ash	Sulphur	B.T.U's.
1417	3A	136'11" - 138'11½"	3.8	17.0	29.5	49.7		
1418	4	138'11½"- 143'4½"	3.6	20.5	40.6	35.3		
1419	6	151'8½" - 155'6"	4.3	21.5	37.0	37.2		
1420	21A	406'2½" - 409'	3.3	21.7	34.2	40.8		
1421	21B	409'5" - 411'4½"	3.6	22.8	30.2	43.4		
1422	25A	439' - 440'3½"	3.8	12.0	16.7	67.5		
1423	26A	440'3½" - 443'1½"	3.3	24.3	46.9	25.5	0.24	9,880
1424	27	443'8" - 450'	3,6	22.8	46.9	26.7	0.24	9,530
1425	28	461'9" - 465'	3.9	20.2	30.9	45.0		
1426	29	579' - 582'5"	3.9	19.4	36.1	40.6		
1427	30	598'4" - 604'7"	4.9	18.4	39.3	37.4		
1428	31	620'4" - 622'8"	3.4	21.9	43.1	31.6	0.24	8,730
1429	32	637'2" - 639'4"	4.1	19.2	27.5	49.2		
1430	33	644'2½" - 646'7"	3.3	20.5	3.4	42.2		

JUBILEE COLLIERY, JUBILEE - HOLE NO. 1.

ft.	in.	ft.	in.	Remarks
0	0	9	0	No core.
9	0	16	0	Light yellowish-green weathered medium-grained sandstone.
16	0	44	0	Light grey medium-grained lithic sandstone; calcareous in part.
44	0	50	0	Light yellowish-green medium-grained weathered sandstone.
47	0			Clay pellets.
50	0	55	0	Light grey medium-grained sandstone.
55	0	62	00	Light yellowish-green medium-grained weathered sandstone; few coal lenses.
62	0	67	0	Light-grey fine-grained lithic sandstone.
67	0	69	0	Light grey medium-grained sandstone; some broken pieces.
69	0	73	0	Medium grey siltstone.
73	0	74	6	Black carbonaceous shale (clod.)
74	6	77	0	Light grey fine-grained sandstone; 1/16"-½" carbonaceous layering; dip 5°.
77	0	80	0	Medium grey siltstone.
80	0	89	6	Medium grey fine-grained lithic sandstone; thin 1/16" carbonaceous layering; dip 5°.
89	6	93	6	Light yellowish-green fine-grained weathered sandstone; coarser at top.
93	6	95	0	Medium grey fine-grained sandstone.
95	0	115	0	Light yellowish green fine to medium grained weathered sandstone.
105	0	106	6	Fresh sandstone.
115	0	118	0	Light grey medium-grained sandstone with carbonaceous layers; dip 5°.
118	0	119	0	Black carbonaceous shale (clod)
119	0	119	6	Laminated medium-grained sandstone and black carbonaceous shale.
119	6	121	0	Medium grey silty mudstone.
121	0	138	6	Laminated medium grey siltstone, sandstone and mudstone with carbonaceous laminae, dip to 10°.
138	6	141	6	Light grey fine-grained lithic sandstone.
141	6	142	0	Lark grey slickensided mudstone.
142	0	156	0	Medium grey siltstone with 1/16" carbonaceous laminations; dip 5°.
156	0	158	0	Light grey fine-grained lithic sandstone.
158	0	167	6	Light greenish grey medium-grained lithic sandstone with few coaly partings.
167	6	169	0	Black carbonaceous shale (clod)
169	0	171	0	Dark grey carbonaceous siltstone.
171	0	177	0	Interbedded light grey fine-grained sandstone and dark grey siltstone with carbonaceous laminations; dip to 10°.
177	0	182	0	Medium grey laminated carbonaceous siltstone.

FT.	in.	ft.	in.	Remarks
182	0	196	0	Interbedded dark grey siltstone, sandstone and black carbonaceous shale.
192	0			1" coal
196	0	197	0	Black carbonaceous shale (clod)
197	0	203	0	Interbedded dark grey siltstone and mudstone; dip 5°.
203	0	205	0	Medium grey mudstone.
205	0	228	0	Interbedded medium grey siltstone, fine sandstone.
228	0	231	6	Light grey medium-grained lithic sandstone.
231	6	232	0	Medium grey siltstone.
232	0	248	0	Light grey medium-grained lithic sandstone.
(240	0	241	0	1" zone of clay pellets.)
248	0	249	0	Light grey coarse-grained sandstone; broken.
249	0	252	6	Light grey medium-grained lithic sandstone; crumbly.
252	6	253	0	Lark grey clay pellet conglomerate and siltstone.
253	0	256	0	Light grey fine-grained sandstone with siltstone bands and carbonaceous laminations
256	0	268	0	Light grey medium-grained lithic sandstone.
(260	0			Two ¼" bands black siltstone, dip 5°.)
268	0	272	0	Whitish grey medium-grained lithic sandstone.
272	0	274	6	Light grey fine-grained lithic sandstone.
274	6			2" band dark grey silty mudstone.
274	6	276	0	Light grey medium-grained lithic sandstone.
276	0	283	6	Light grey fine-grained lithic sandstone; few carbonaceous laminations; dip to 10°.
283	6	284	0	Light grey medium-grained lithic sandstone.
284	0	289	0	Interbedded dark grey siltstone and silty mudstone.
289	0	294	0	Light grey medium to fine grained lithic sandstone.
294	0	294	6	2" contorted black carbonaceous shale and 4" medium grey medium-grained lithic sandstone.
294	6	297	0	Whitish -grey fine-grained lithic sandstone; few clay pellets.
297	0	299	6	Light grey medium-grained lithic sandstone.
299	6	300	0	Medium grey coarse grained lithic sandstone with coal lenses; crumbly.
301	0	304	0	Interbedded dark grey siltstone and fine sandstone.
304	0	304	6	Black carbonaceous shale (clod)
304	6	306	0	Lark grey slickensided mudstone.
306	0	311	0	Light grey fine grained lithic sandstone.
311	0	314	6	Light grey medium-grained lithic sandstone.
314	6	317	0	Light grey fine-grained lithic sandstone.

ft.	in.	ft.	in.	Remarks
317	0	324	0	Interbedded dark grey siltstone, silty mudstone and light grey fine-grained lithic sandstone.
324	0	327	6	Medium grey siltstone.
327	6	330	6	Interbedded medium-grey siltstone and silty mudstone.
330	6	331	6	Black carbonaceous shale (clod).
331	6	332	0	Dark grey silty mudstone.
332	0	333	0	Light grey fine-grained lithic sandstone with numerous carbonaceous laminations.
333	0	339	6	Interbedded dark grey siltstone, mudstone and light grey fine-grained sandstone.
339	6	340	0	Black carbonaceous shale (clod).
340	0	343	0	Medium grey siltstone.
343	0	345	6	Medium grey coarse-grained lithic sandstone.
345	6	349	0	Interbedded medium grey silty mudstone and siltstone.
349	0	349	6	Black carbonaceous shale (clod) with $\frac{1}{8}$" coal lenses.
349	6	351	6	Medium grey silty mudstone.
351	6	352	0	Black carbonaceous shale with 1/16" clay pellets.
352	0	353	0	Medium greenish-grey silty mudstone.
353	0	362	0	Light greenish-grey volcanic with small zeolite vughs and veins; fine-grained basalt.
362	0	364	6	Black silty mudstone with inclusions of light greenish-grey volcanic rock.
364	6	371	0	Medium to dark grey siltstone with numerous iron particles.
371	0	373	6	Light greenish-grey fine-grained lithic sandstone.
373	6	374	6	Light greenish-grey coarse-grained sandstone.
374	6	375	6	Medium-grey siltstone.
				Hole completed 375' 6".
				Logged by S.J. Paterson.
				5-10-1959.

log of diamond drill hole sunk in level of Deep east 370 yards from portal.

Depth ft.			
0	-	3	Shaly coal (part of main seam left in floor)
3	-	6	Mudstone grading into siltstone at base
6	-	52	Feldspathic sandstone containing coal fragments between 25 and 27 feet.
52	-	54	Grey shale - thinly carbonaceous
54	-	55	Carbonaceous shale and coal
55	-	110	Feldspathic sandstone
110	-	133	Grey shale (60% Recovered)

[illegible] BORE:-

Strata	Depth.	Probable Correlation
	Ft. Ins. Ft. Ins.	
Surface shaft	0 - 12 .6	
Surface soil and drift	12 . 6 - 30 .0	
Shale showing fossils	30 . 0 - 62 .0)	Ferntree
Hard shale	62 . 0 - 120 .0)	Group
Conglomerate	120 . 0 - 124. 0)	
Hard limestone	124. 0 - 256. 11)	Cascades
Shaly mudstone with seams of carbonate of lime	256. 11 - 275. 0)	Group
Hard shaly mudstone	275. 0 - 282. 1)	
Shaly mudstone and conglomerate	282. 1 - 292. 4)	
Hard shaly mudstone	292. 4 - 342. 0)	
Sandstone with coal stains	342. 0 - 350. 0)	
Sandstone and conglomerate	350. 0 - 389. 6)	Mersey
Sandstone with coal stains	389. 6 - 414. 6)	Group
Sandstone, shale, and conglomerate	414. 6 - 433. 8)	
Conglomerate	433. 8 - 466. 0)	
Black shale	466. 0 - 468. 3)	
Conglomerate	468. 3 - 500. 3)	
Hard slate	500. 3 - 504. 6	Mathinna Beds

HAREFIELD BORE:-

Surface shaft, clay and drift	0. - 9. 0	
Surface shaft, sandstone	9. 0 - 16. 0	
Shale	16. 0 - 3[illegible]. 6	
Sandstone	3[illegible]. 6 - 33. 0	
Coal and band of shale	33. 0 - 37. 4	Triassic
Coal	37. 4 - 39. 7	System
Shale	39. 7 - 40. [illegible]	
Sandstone with thin coal seams	40. [illegible] - 70. 2	
Sandstone and shale	70. 2 - [illegible]. 1	

Well 1.33 Part (Cont.)

Strata	Depth				Probable Correlation
	Ft.	Ins.	Ft.	Ins.	
Coal	95.	1	96.	9	
Beds of clay, sandstone and coal	96.	9	98.	7	Triassic System
Sandstone	98.	7	116.	7	
Black shale	116.	7	124.	1	
Sandstone	124.	1	127.	3	
Coal	127.	3	130.	0	
Black and blue shale and fireclay	130.	0	152.	6	
Sandstone and shale	152.	6	177.	10	
Sandstone	177.	10	194.	4	
Shale and fireclay	194.	4	203.	4	
Sandstone, shale and coal	203.	4	230.	6	
Conglomerate and hard blue sandstone	230.	6	300.	0	Pennsylvanian Group
Blue shale	300.	0	363.	0	
Conglomerate	363.	0	365.	0	
Gray sandstone	365.	0	371.	6	
Greenish sandstone	371.	6	383.	6	
Mississippian limestone	383.	6	412.	0	Osagean Group
Limestone and conglomerate	412.	0	443.	3	
Mississippian limestone	443.	3	523.	6	
Hard gray sandstone	523.	6	540.	0	
Sandstone and shale	540.	0	563.	2	
Limestone	563.	2	577.	0	Kinderhook Group
Conglomerate, shale and sandstone	577.	0	631.	0	
Coal	631.	0	632.	0	
Hard sandstone	632.	0	653.	0	
Limestone	653.	0	663.	0	
Siliceous conglomerate	663.	0	665.	6	
Siliceous white rock chats	665.	6	737.	0	
T.D.	737.		737.	0	Undifferentiated

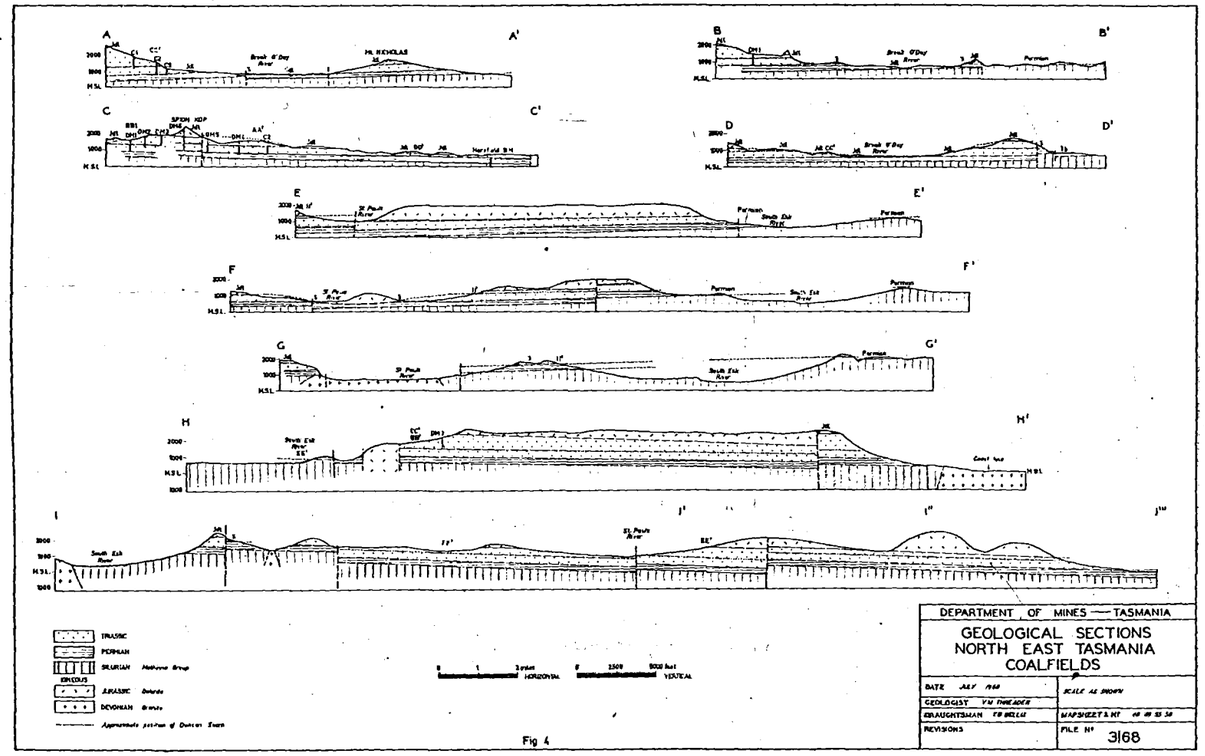
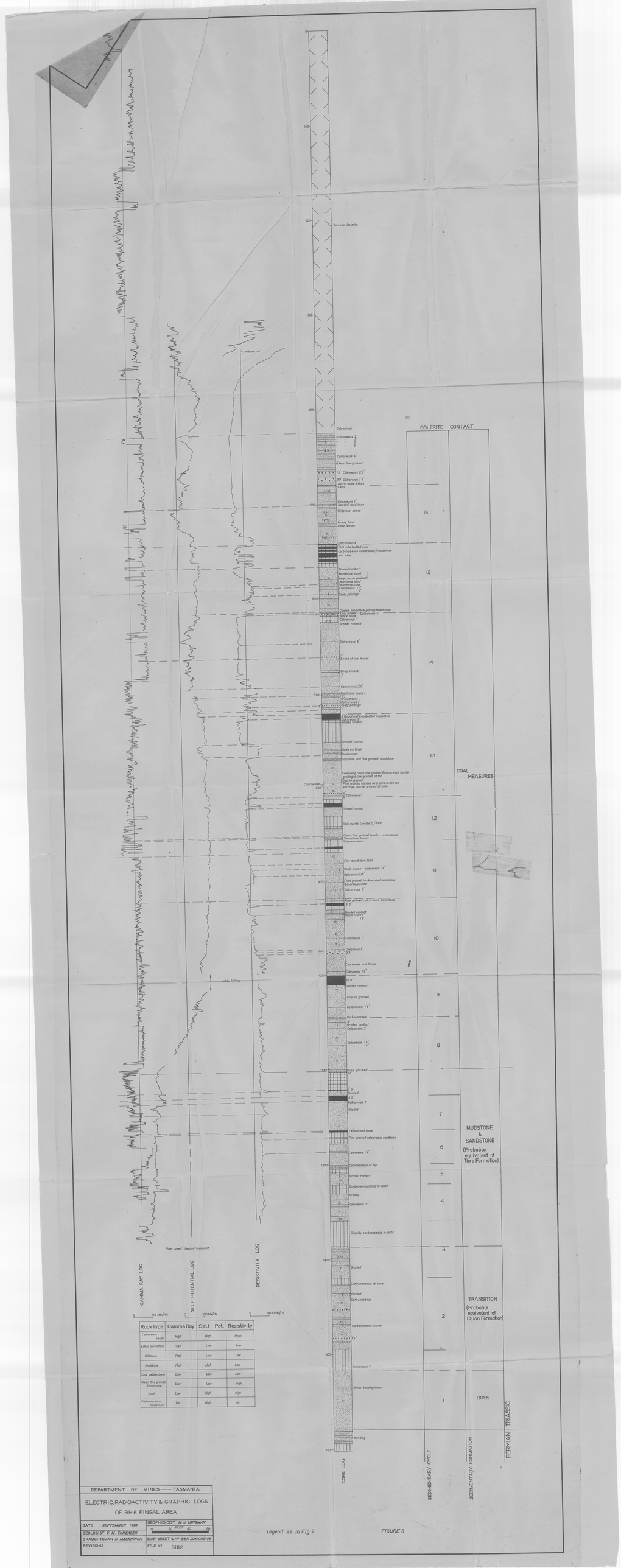


Fig 4.

DEPARTMENT OF MINES — TASMANIA

GEOLOGICAL SECTIONS NORTH EAST TASMANIA COALFIELDS

DATE JULY 1968	SCALE AS SHOWN
GEOLOGIST V.M. THREADER	
DRAUGHTSMAN T.D. BELLI	MAPSHEET & MT 40 49 55 56
REVISIONS	FILE N° 3168



Rock Type	Gamma Ray	Self Pot.	Resistivity
Calcareous bands	High	High	High
Lithic Sandstone	High	Low	Low
Siltstone	High	Low	Low
Mudstone	High	High	Low
Clay pebble bond	Low	Low	Low
Clean fine grained Sandstone	Low	Low	High
Coal	Low	High	High
Carbonaceous Mudstone	Var.	High	Var.

DEPARTMENT OF MINES — TASMANIA

ELECTRIC, RADIOACTIVITY & GRAPHIC LOGS OF B.H.6 FINGAL AREA

DATE SEPTEMBER 1968	GEOPHYSICIST M. J. LONGMAN
GEOLOGIST V. M. THREADER	0 20 FEET 40 60
DRAUGHTSMAN H. MACKINNON	MAP SHEET & No. BEN LOMOND 48
REVISIONS	FILE No. 3182

Legend as in Fig. 7

FIGURE 8

LEGEND

JURASSIC — DOLERITE

QUATERNARY — SCREE

TRIASSIC — FELDSPATHIC SANDSTONE

Q — QUARTOSE SANDSTONE

SILTSTONE

MUDSTONE

CLAY

COAL

INTERBEDDED SANDSTONE & MUDSTONE

INTERBEDDED SILTSTONE & MUDSTONE

INTERBEDDED SANDSTONE & SILTSTONE

CLAY PELLET CONGLOMERATE

MUDSTONE & SANDSTONE FRAGMENTS (POORLY BEDDED)

QUARTZ PEBBLE CONGLOMERATE (BASAL CONGLOMERATE)

PERMIAN — MUDSTONE / GREYWACKE SANDSTONE

LIMESTONE

C — BANDED CARBONACEOUS

GRADED BEDDING (FINING IN DIRECTION OF ARROW)

SEDIMENTARY FORMATION

② SEDIMENTARY CYCLE

COAL SEAM

CLAY PELLET HORIZON

PROBABLE FAULT

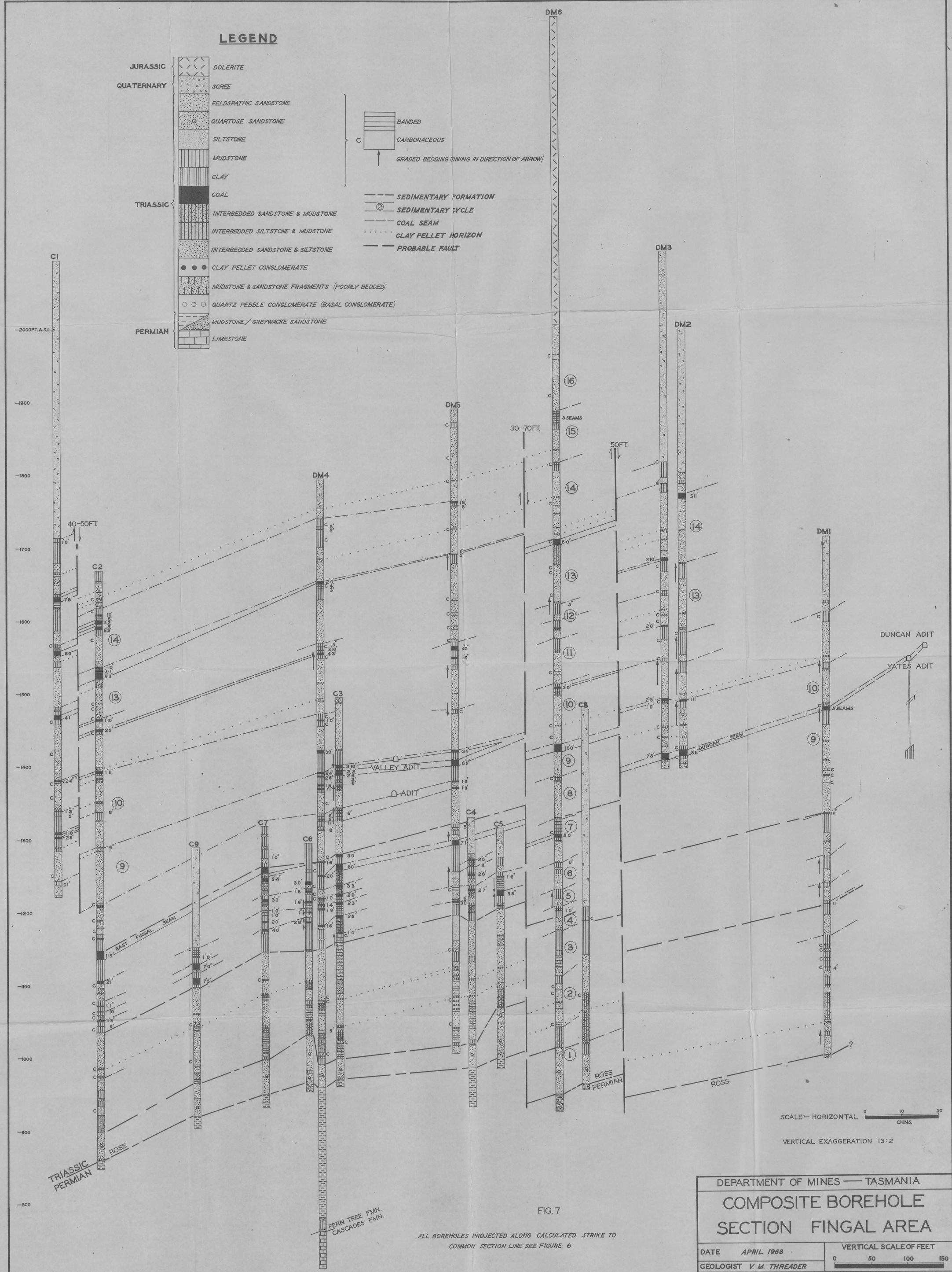


FIG. 7

ALL BOREHOLES PROJECTED ALONG CALCULATED STRIKE TO COMMON SECTION LINE SEE FIGURE 6

SCALE:— HORIZONTAL 0 10 20 CHNS.

VERTICAL EXAGGERATION 13:2

DEPARTMENT OF MINES — TASMANIA

COMPOSITE BOREHOLE SECTION FINGAL AREA

DATE *APRIL 1968*	VERTICAL SCALE OF FEET 0 50 100 150
GEOLOGIST *V. M. THREADER*	
DRAUGHTSMAN *H. M. G. MACKINNON*	MAPSHEET & N° *ST. MARYS 49*
REVISIONS	FILE N° 3160

REDUCE TO 12"


DEPARTMENT OF MINES — TASMANIA
GEOLOGICAL MAP
NORTH EAST TASMANIA
COALFIELDS
DATE JULY 1968
GEOLOGIST V.M. THREADER
DRAUGHTSMAN T.R. BELLIS
REVISIONS
SCALE OF MILES
0 1 2 3
MAPSHEET & Nº 48, 49, 55, 56
FILE Nº 3167
QUATERNARY
Recent Alluvium
Dolerite Talus
Terrace deposits
TRIASSIC
Sandstone Coal Measures
Ross Sandstone
PERMIAN
Ferntree Mudstone
Berriedale Limestone
Undifferentiated
SILURIAN
Mathinna Group sandstone, shale
IGNEOUS ROCKS
TERTIARY
Basalt
JURASSIC
Dolerite
DEVONIAN
Granite
Fault
Fault inferred
Geological boundary
Boreholes
Road
Railway
Section Line
Coal workings
AVOCA
Township
DUNCAN
Coal mine
Recommended drilling site
Magnetic
True
N
To Mathinna
TOWER HILL
CASTLE
CAREY
FAULT
MANGANA
Jurassic Dolerite
ESK
SOUTH
RIVER
BREAK
O'DAY
FINGAL
To Storeys Creek and Rossarden
Basalt
AVOCA
SILKSTONE
MT. NICHOLAS
NICHOLAS
CORNWALL
Cornwall B.H.1
B.H.2
Jubilee B.H.1
Killymoon B.H.
To Falmouth
ST. MARYS
DUNCAN
VALLEY
VATES
ST. PATRICKS HEAD
Harefield B.H.
ST. PAULS DOME
ST. PAULS RIVER
MERRYWOOD
CORWALL
FAULT
DALMAYNE
PICCANINNY POINT
LONG POINT
SEYMOUR
DOUGLAS RIVER
DENISON RIV
APSLEY RIVER
SWAN RIVER
To Cranbrook
BICHENO

GRID NORTH

AVERAGE STRIKE OF R/P CONTACT (100'/MILE OR 1 IN 52)

DUNCAN ADIT 1568

YATES ADIT 1552

C8 1476 / 965

C5 1314 / 997

C4 1328 / 986

C6 1294 / 964

C7 1317 / 948

C9 1288 / 920

C3 1494 / 972

C2 1669 / 864

VALLEY MINE 1407

DM4 1794 / 960

DM5 1889 / 990

C1 2094

DM3 2106

DM6 2427

DM2 1997

DM1 1724 / 1004

DM7 (APPROX. POSN.)

SECTION LINE

COLLAR ELEVATION
R.L. PMN. CONTACT

FIGURE 6

DEPARTMENT OF MINES — TASMANIA

LOCATION OF BOREHOLES FINGAL AREA

DATE *JUNE 1968*	0 CHN 20 40 / 0 FT. 1000 2000
GEOLOGIST *V. THREADER*	
DRAUGHTSMAN *H. MACKINNON*	MAPSHEET & N° *B. LOMOND 48*
REVISIONS	FILE N° 3166