DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept. Bk. No. 80/116

MESOZOIC STRATIGRAPHY OF THE FROME EMBAYMENT

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FOSSIL FUELS SECTION

February, 1980

D.M. No. 569/76

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DEPARTMENT OF MINES AND ENERGY
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MESOZOIC STRATIGRAPHY OF THE FROME EMBAYMENT

ABSTRACT

Mesozoic rocks in the Frome Embayment were deposited in a southern lobe of the Eromanga Basin. The basal Algebuckina Sandstone (Jurassic) consists predominantly of coarse-grained fluviatile deposits with a subordinate fine-grained facies of lacustrine origin. An overlying transgressive Cretaceous sequence is comprised of marginal marine siltstones and shales of the Cadna-owie Formation which grade upwards into marine shales and siltstones of the Bulldog Shale.

To the north, in the area of the southwestern Cooper Basin, a different nomenclature is applied to the Mesozoic sequence, which is considerably thicker than that in the Frome Embayment. Lower Jurassic Hutton Sandstone and Birkhead Formation have been tentatively identified in several drill holes. The Algebuckina Sandstone equivalent (Mooga Formation) consists of the Namur Member, which is predominantly sandstone, overlain by fine-grained siltstones and shales of the Murta Member. The Transition Beds, equivalent to the Cadna-owie Formation, are overlain by marine shales of the Tambo and Roma formations. These units are readily correlated by gamma-ray logs from wells in the area. To the east, in Fortville 3, the Mesozoic section is much reduced: the Murta Member is absent and the Mooga Formation is composed mainly of sandstone.

1. INTRODUCTION

This study deals with the Mesozoic stratigraphy of the Frome Embayment (Fig. 1), which is that area bounded by the Flinders Ranges to the west, the Barrier Ranges to the east and a range of low hills from Scott Hill to Mundaerno Hill

TABLE 1
WELL DATA

DRILLHOLE	PETROPHYSICS	CUTTINGS	CORE	REFERENCE	SPONSOR
Arboola Bore		Incomplete	No		E.& W.S.
Black Oak Bore		Yes	No	Ker (1966)	E.& W.S.
Bumbarlow 1	Gamma, neutron.	Yes	No	Youngs (1978)	Dept. Mines and Energy
Cherri 1	Gamma, sonic.	Yes	No	Pexa Oil N.L. (1970 a)	Pexa Oil N.L.
Cootabarlow 1		Incomplete	No	Ker (1966)	Enterprise Exploration
Cootabarlow 2		Yes	No	Ker (1966)	"
Cootabarlow 3		Incomplete	No	Ker (1966)	"
Fortville 3	Gamma, resistivity, S.P.	Yes	Incomplete	Wopfner & Cornish (1967)	Dept. Mines and Energy
Gurra 1	Gamma, sonic.	Yes	No	Pexa Oil N.L. (1970 d).	Pexa Oil N.L.
Kumbarie 1	Gamma, sonic	Yes	No	Pexa Oil N.L. (1970 b)	"
Lake Frome 1	Gamma.	Yes	No	Delhi Petroleum (1968 a)	Delhi Australia Petroleum Ltd.
Lake Frome 2	Gamma, sonic, resistivity.	Incomplete	No	"	"
Lake Frome 3	Gamma, sonic, resistivity.	–	–	"	"
Lakeside		Yes	No	Kerr (1966)	Enterprise Exploration
Mudguard 1	Gamma, neutron, resistivity.	No	No	Youngs (1977)	Dept. Mines and Energy
Muloowurtina 2		No	No	Callen (1970 a)	E.& W.S.
Poontana		Yes	No	Callen (1970 b)	"
Tinga Tingana 1	Gamma, sonic.	Yes	No	Delhi Petroleum (1968 b)	Delhi Australia Petroleum Ltd.
Weena 1	Gamma, sonic.	Yes	No	Pexa Oil N.L. (1970 c)	Pexa Oil N.L.
Yalkalpo 1	Gamma, neutron, resistivity, S.P.	Yes	Yes	Callen (1972)	Dept. Mines and Energy
Yalkalpo 2	Gamma, neutron.	Yes	No	Youngs (1977)	"

For location of wells see plan no. 80-182 (Fig.1)

TABLE 1

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MESOZOIC STRATIGRAPHY – FROME EMBAYMENT

WELL DATA

SCALE

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in the south (Ker, 1966). An arbitrary northern limit runs from Moolawatana Station to the Cooranna bore. The Mesozoic sequence underlying this area constitutes what is, essentially, a southern lobe of the Eromanga Basin.

In the South Australian portion of this region outcrop is meagre, being restricted to the northeastern margin of the Mount Painter Block (Fig. 1). However numerous water bores and a number of oil exploration and stratigraphic wells have penetrated the Mesozoic sequence. Table 1 summarises drill holes examined and relevant data available from each.

Drill holes examined from the southwestern portion of the Cooper Basin (Cherri 1, Curra 1, Weena 1, Tinga-Tingana 1, and Kumbarie 1) provide a link between the Frome Embayment and the Cooper Basin region and correlations between the two areas are attempted in this report. However a lack of petrophysical and palaeontological data, especially in the Frome Embayment wells, makes correlations questionable. For similar reasons correlations between wells within the Frome Embayment should be regarded with caution even though some of the lithological subdivisions appear to be consistent over the area.

Despite these reservations, it is important to attempt to trace basinward the Mesozoic sequences of the Frome Embayment, since these thicken dramatically to the north in the Cooper Basin region and have considerable hydrocarbon bearing potential.

2. PREVIOUS INVESTIGATIONS

Study of the Mesozoic sequence in the Frome Embayment has been very limited. Whittle and Chebotarev (1952) attempted the correlation of wells drilled by Enterprise Exploration Ltd. with wells drilled farther north. Brown (1950, 1953) and Ludbrook (1962, 1966) studied the biostratigraphy of Cretaceous sediments in this region. Palynological studies of the Cretaceous sequence were conducted by Dettman (1963) and Dettman and Playford (1969). Ker (1966) incorporated in a hydrological study of the area descriptions of cuttings from many of the wells and also attempted some regional correlations.

The regional geology of the area is described by Callen (1976), and some uncompiled core and cuttings descriptions by the same author (Yalkalpo 1, Muloowurtina and Poontana) are used in this report. The Mesozoic sequences in Yalkalpo 2, Mudguard 1 and Bumbarlow 1 are described by Youngs (1977, 1978). Similarly well completion reports are available for Lake Frome nos. 1, 2 & 3 (Delhi, 1968a), Cherri 1 (Pexa, 1970a), Gurra 1 (Pexa, 1970d), Kumbarie 1 (Pexa, 1970b), Weena 1 (Pexa, 1970c) and Tinga Tingana 1 (Delhi, 1968b).

3. STRATIGRAPHY

Stratigraphic nomenclature in the western and south-western Eromanga Basin is summarised in Table 2.

The most commonly cited Mesozoic formations in the South Australian Eromanga Basin are in the Oodnadatta area, where the Jurassic-Cretaceous sequence consists of the basal Algebuckina Sandstone, Cadna-owie Formation and Mount Anna Sandstone Member (Wopfner et al., 1970). To the south, in the Moolawatana area, a different stratigraphic nomenclature was proposed by Ludbrook (1966) and Forbes (1966). The sequence there consists of the basal Village Well Formation, overlain by the Pelican Well

OODNADATTA AREA	MARREE AREA	MOOLAWATANA AREA	SOUTHERN COOPER BASIN WELLS
WINTON FORMATION	BLANCHEWATER FORMATION	BLANCHEWATER FORMATION	WINTON FORMATION
OODNADATTA FORMATION Wooldridge Limestone Mbr. Coorikiana Sandstone Mbr.	MARREE Attraction Hill Sandstone Member	MARREE	TAMBO FORMATION
BULLDOG SHALE	FORMATION Trinity Well Sandstone Member	FORMATION	ROMA FORMATION
CADNA-OWIE FORMATION Mount Anna Sandstone Member	PELICAN WELL FORMATION	Parabarana Sandstone PELICAN WELL FORMATION	—Seismic C Horizon— TRANSITION BEDS
ALGEBUCKINA SANDSTONE	VILLAGE WELL FORMATION	VILLAGE WELL FORMATION	MOOGA FORMATION Murta Member Namur Member

TABLE 2

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE:
COMPILED: A.J. Truelove	MESOZOIC STRATIGRAPHY - FROME EMBAYMENT LITHOSTRATIGRAPHIC CORRELATION OF ROCK UNITS BETWEEN WESTERN AND SOUTHERN MARGIN OF GREAT ARTESIAN BASIN	DATE: March 1980
DRN: M.R. CKD:		PLAN NUMBER S 14698
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Formation which includes the Parabarana Sandstone Member. Despite the proximity of the Moolawatana area to the Frome Embayment, previous workers have adopted the nomenclature of Wopfner et al. (1970) for the basal Mesozoic sandstones and used the name Marree Formation (after Forbes, 1966) for the overlying Cretaceous shale sequence. To avoid confusion, this report will adopt the same approach. The nomenclature applied to wells on the margin of the Cooper Basin is the same as that used by Delhi-Santos and Pexa Oil (Tables 2 and 3); the Mooga Formation (Algebuckina Sandstone equivalent) is subdivided into a lower Namur Member and an upper Murta Member. The overlying Transition Beds are considered to be Cadna-owie Formation equivalents and the Tambo and Roma formations are questionable correlatives of the Marree Formation. The Birkhead Formation and the Hutton Sandstone, underlying the Mooga Formation, are not represented in the Frome Embayment area. Within the Eromanga Basin sequence a widely recognised seismic reflector, the "C-Horizon," occurs near the top of the Transition Beds (Cadna-owie Formation).

The most thoroughly studied section in the Frome Embayment is in Yalkalpo 1, which was fully cored through the Mesozoic sequence and has supplementary palaeontological and petrophysical data (Callen, 1972). Yalkalpo 1 is regarded as a central reference section in the Frome Embayment. Cuttings and core descriptions from this well are included in Appendices A and B respectively. Figure 2 summarises regional relationships between Mesozoic rock units in the Frome Embayment, and Table 4 summarises Mesozoic formation tops penetrated in Frome Embayment wells.

TABLE 3

STRATIGRAPHIC TABLE

	FROME EMBAYMENT		COOPER BASIN WELLS (S.E. Margin)	
CRETACEOUS	MARREE FORMATION	Grey and blue claystone, carbonaceous and occasionally silty.	ROMA AND TAMBO FORMATIONS	Grey and blue shale with minor sandstone and limestone.
CRETACEOUS	CADNA-OWIE FORMATION	Grey and blue pebbly claystone and siltstone, often carbonaceous and occasionally sandy and calcareous.	TRANSITION BEDS	Grey shale with interbedded siltstone and very fine to medium grained sandstone.
JURASSIC	ALGEBUCKINA SANDSTONE	Coarse to very coarse grained quartz sandstone and/or blue and grey pebbly shales and mudstones.	MOOGA FORMATION – Murta Mem	Interbedded siltstone and shale and very fine grained sandstone
JURASSIC			MOOGA FORMATION – Namur Member	Coarse grained quartz sandstone with minor interbeds of siltstone and shale.
JURASSIC			BIRKHEAD FORMATION	Grey carbonaceous shale.
JURASSIC			HUTTON SANDSTONE	Massive coarse grained sandstone.

TABLE 3

	DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	SCALE
COMPILED A.J. Truelove	MESOZOIC STRATIGRAPHY - FROME EMBAYMENT	DATE Feb. 1980
DRN M.R. CKD	STRATIGRAPHIC TABLE	PLAN NUMBER
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Yalkalpo 1

Callen (1972) placed the top of the Mesozoic sequence at 81.7 m, where coarse grained Tertiary sandstones are in sharp contact with carbonaceous siltstones and claystones of the Marree Formation.

The top of the Cadna-owie Formation, at 160 m, is picked at the beginning of a gradual downwards increase in the gamma-ray and neutron log counts. A downwards increase in the pebble content of the claystone is the only discernible lithological change.

The top of the Algebuckina Sandstone, at 200.9 m, is marked by a downwards grainsize change from very fine-grained sandstone to claystone, and a sharp decrease in mica content. A basal conglomerate within the Algebuckina Sandstone disconformably overlies green and red Cambrian shales at 216.8 m.

Yalkalpo 2

The sequence here is similar to that in Yalkalpo 1. The top of the Marree Formation occurs at 66 m, where there is a lithologic change downward from coarse sandstone to silty mudstone, with an associated slight increase in the gamma-ray log counts and a large decrease in the neutron log counts, as was found in Yalkalpo 1.

The top of the Cadna-owie Formation is at 156 m and is best characterised by the increased gamma-ray/neutron log responses; it also coincides with a downward increase in pebble content. A sharp decrease in mica content at 216 m by analogy with Yalkalpo 1 indicates the top of the Algebuckina Sandstone; this contact also can be picked from the gamma-ray/ neutron logs. No other obvious lithologic changes are evident across this contact. It should be noted that the above subdivisions differ from those of Youngs (1977).

TABLE 4

MESOZOIC FORMATION TOPS, FROME EMBAYMENT WELLS

Measured depths are below well datum.
Depths in brackets are subsea depths, in metres
NR = not reached

WELL	TOP MARREE FMN	TOP CADNA-OWIE FMN	TOP ALGEBUCKINA	BASE OF MESOZOIC
Yalkalpo No. 1	81.7m (-40m)	160m (-118m)	200.9m (-158-9m)	216.8m (-174.8m)
Yalkalpo No. 2	66m (-16m)	156m (-106m)	216m (-166m)	258m (-208m)
Mudguard No. 1	99m (-57m)	148m (-105.9m)	?187m (-144.9m)	194m (-151.9m)
Arboola	450' (-107m)	748' (-198m)	1060' (-293m)	NR
Lakeside Bore	?600' (-142m)	?750' (-188m)	1010' (-267m)	1073' (-287m)
Black Oak Bore	280' (-62m)	390' (-95m)	ABSENT?	448' (-113m)
Lake Frome 1	460' (-134m)	?	ABSENT	610' (-180m)
Lake Frome 2	410' (-123m)	ABSENT	ABSENT	530' (-160m)
Lake Frome 3	ABSENT	ABSENT	ABSENT	
Bumbarlow 1	192m (-161m)	261m (-230m)	357m (-326m)	402m (-371m)
Cootabarlow 3	540' (-135m)	900' (-244m)	1230' (-345m)	1375' (-389m)
Cootabarlow 2	600' (-153m)	1250' (-351m)	1470' (-418m)	1615' (-462m)
Cootabarlow 1	180m (-150m)	363m (-333m)	NR	
Mulloowurtina 2	?555' (-155m)	?1360' (-400m)	NR? (-400m)	
Poontana 1	1070' (-308m)	1440' (-421m)	1632' (-480m)	NR

Mudguard 1

Cuttings from the Mesozoic sequence originally logged by Youngs (1977) are unavailable for inspection, and the petrophysics proved difficult to interpret. Therefore Youngs' (1977) interpretation is tentatively accepted for this report.

Arboola Bore

Subdivision of the Mesozoic sequence proved difficult, due to the irregular collection of cuttings samples and the absence of any petrophysics. The interpreted formation boundaries therefore should be considered as tentative.

The top of the Marree Formation occurs at 450 ft, where a coarse sandstone is underlain by grey silty shales. The top of the Cadna-owie Formation could not be discerned from the cuttings. The top of the Algebuckina Sandstone is placed tentatively at 1060 ft, where there is a marked lithologic change downward from grey silty mudstone to coarse-grained quartz sandstone. Cuttings were not collected to the base of the Mesozoic.

Lakeside Bore

Cuttings were collected at irregular intervals and no electric logs were run. In the present interpretation, the top of the Marree Formation is tentatively placed at 600 ft and the top of the Cadna-owie Formation probably occurs at about 750 ft, where the granule component of the claystones increases. A change from mudstone to coarse-grained sandstone at 1010 ft is considered to mark the top of the Algebuckina Sandstone. This interpretation differs from that of Ker (1966). The base of the Mesozoic sequence is placed tentatively at 1073 ft.

Black Oak Bore

No petrophysical logs are available for this well. The top of the Marree Formation is picked at 280 ft on the basis of a downward lithology change from coarse-grained sandstone to siltstone and mudstone.

It is difficult to pick the top of the Cadna-owie Formation. Although Ker (1966) placed this boundary at 360 ft, where there is a significant downward increase in sandstone content, the overall downward increase in grain size appears to be gradational. A gravel component becomes significant at 390 ft and, by comparison with surrounding wells, this appears to be a better criterion for defining the formation boundary.

At a depth of 448 ft silty sandstones disconformably overlie red and green Cambrian shales. There is no evidence of the Algebuckina Sandstone: it probably wedges out in the vicinity of this well (Fig. 2).

Lake Frome 1

The top of the Mesozoic sequence is placed at 460 ft on the basis of a downward lithological change from sandstone to shale which is reflected on the gamma-ray log; note that this interpretation differs from that in the well completion report (Delhi, 1968a). The base of the Mesozoic sequence occurs at 610 ft where there is a sharp gamma-ray and sonic log response.

A thin Cadna-owie Formation may occur near the base but there is no evidence of Algebuckina Sandstone, suggesting that this formation wedges out near Black Oak Bore.

Lake Frome 2

The top of the Mesozoic sequence is placed at 410 ft on the basis of gamma-ray and sonic log character. The base of this sequence is placed at 530 ft where there is a sharp break in the sonic, gamma-ray and resistivity logs. There is no evidence of Cadna-owie Formation or Algebuckina Sandstone.

Lake Frome 3

Mesozoic sediments are interpreted to be absent in the well completion report (Delhi, 1968a), but a comparison of gamma-ray logs with those from Lake Frome 2 indicates there may be a ten to twenty feet thickness of Mesozoic strata. Both these interpretations show that the Mesozoic sequence is wedging out in the vicinity of the well.

Bumbarlow 1

In this well the top of the Mesozoic sequence is placed at 192 m on the basis of a downward lithology change from coarse sandstone to mudstone and an associated downward increase in gamma-ray readings.

The top of the Cadna-owie Formation is placed at 261 m mainly on the basis of increased gamma-ray log counts. Lithological changes include an increase in the pebble content and a decrease in mica content downwards across the boundary.

The top of the Algebuckina Sandstone occurs at 357 m with a marked decrease in the mica content. A basal conglomerate disconformably overlies red and green Cambrian shales at 402 m.

Cootabarlow 3

Cuttings from this hole were available only between 600 and 980 ft, and Ker's (1966) descriptions are used here to determine stratigraphic picks, which must be regarded with caution. No petrophysical logs are available.

The top of the Mesozoic sequence is placed at 540 ft where the lithology changes downward from a coarse lignitic sand to a bluish mudstone. The top of the Cadna-owie Formation is placed tentatively at 900 ft on the basis of an increase in pebble content of the mudstone. The top of the Algebuckina Sandstone is difficult to define due to lack of information; provisionally the boundary is placed at 1230 ft where the first sandstone occurs. The interpreted base of the Mesozoic sequence is 1375 ft (Ker, 1966).

Cootabarlow 2

The top of the Marree Formation is placed at 600 ft on the basis of a sharp change from sandstone to mudstone. The top of the Cadna-owie Formation is placed tentatively at 1250 ft and is denoted by a downwards increase in pebble content. The basal Cadna-owie Formation consists of calcareous, sandy to silty mudstones with hard quartzitic interbeds and may be an equivalent of the Parabarana Sandstone. There is a sharp decrease in mica content at 1470 ft where the lithology changes from mudstone to conglomeratic sandstone; the top of the Algebuckina Sandstone may be placed here with some certainty.

The base of the Mesozoic sequence is placed at 1615 ft by Ker (1966).

Cootabarlow 1

The top of the Mesozoic sequence is placed at 180 m at a change in lithology from lignitic sandstone to sandy mudstone. The top of the Cadna-owie Formation is placed tentatively at 363 m on the basis of an increased pebble content at this depth. Cuttings are not available to the base of the Cadna-owie Formation. Overall, the formation boundaries correlate very well with the nearby Cootabarlow 2 well.

Muloowurtina 2

No cuttings or petrophysical logs were available from this well, and the following interpretation is based on a preliminary wellsite litho-log compiled by R.A. Callen in 1970 (pers. comm., Jan 1980) which is referenced on the FROME 1: 250 000 sheet (Callen, 1976).

The top of the Mesozoic sequence is placed at 540 ft where the lithology changes from sandstone to claystone. The top of the Cadna-owie Formation could not be defined. The basal unit in the well consists of calcareous, micaceous sandstones and siltstones with abundant granules, and may be an equivalent of the Parabarana Sandstone. The top of the Algebuckina Sandstone was not penetrated.

Poontana 1

The top of the Mesozoic sequence occurs at about 1070 ft where the lithology changes from sandstone to mudstone. The top of the Cadna-owie Formation is placed tentatively at 1440 ft on the basis of a slight increase in grain size and granule component. The top of the Algebuckina Sandstone is placed at 1632 ft on the basis of a lithology change from shale to sandstone. The base of the Mesozoic sequence was not penetrated.

Cooper Basin Wells

The six wells located near the southern margin of the Cooper Basin (Fig.3) penetrated a sequence transitional between the marginal Frome Embayment area and the thicker Eromanga Basin sequences to the north (Fig. 4). The nomenclature adopted in this area differs from that in the Frome Embayment (Tables 2 and 3). However, the Murta Member of the Mooga Formation, previously identified in only three of these wells, is identified herein in all wells. The lateral extent of the Murta Member is unknown, but it appears to wedge out southward towards the Frome Embayment, where it is known to be absent (Fig. 4).

Underlying the Mooga Formation (Namur Member) in most wells is a shale-to-siltstone interval that possibly represents a reduced section of the Birkhead Formation. An interval of sandstone underlying this unit is considered equivalent to the Hutton Sandstone (Fig. 3).

4. DEPOSITIONAL ENVIRONMENTS

The general lack of core and the tentative nature of some stratigraphic interpretations constrains any environmental interpretation of the studied sequences. The few available cores (Yalkalpo 1; Fortville 3) have proved invaluable in this respect; they are described in "Selley"-type logs in Appendix A.

Examination of cuttings indicates that the Algebuckina Sandstone in the Frome Embayment normally is comprised of coarse to very coarse-grained, subangular to subrounded, ferruginous quartz sandstone with a basal conglomerate.

Sandstones overlying the basal conglomerate probably represent braided stream deposits; the red colouration of many of the sandstones is in keeping with subaerial deposition.

In several wells the basal Algebuckina Formation conglomerate is overlain by grey shales (Yalkalpo 1 and 2; Bumbarlow 1). These fine grained sediments suggest low energy, lacustrine deposition, probably in a localised depression. Reddish conglomerates which underlie the shales probably are alluvial fanglomerates.

The Algebuckina Sandstone thickens basinward, where it is correlated with the Mooga Formation (Fig. 4). The Namur Member of this formation consists mainly of braided stream channel deposits with a minor overbank facies component, whereas the Murta Member is consistently fine-grained and probably represents lacustrine and lacustrine fan-delta deposits.

In the Frome Embayment the Cadna-owie and Marree formations and their respective equivalents are very difficult to distinguish, being very fine-grained. The Cadna-owie Formation generally tends to be slightly coarser-grained with minor glauconite, some lignite, and rare calcareous concretions. In addition the sediments are in part bioturbated, and crustacean and brachiopod fossils occur near the top. The environment of deposition of this formation and the Transition Beds (its northern equivalent) is uncertain but may generally be marginally marine. The formation does not thicken markedly basinward.

In the Frome Embayment the Marree Formation consists of interbedded and bioturbated siltstones and shales with minor glauconite, lignite and marine fossils, all of which indicate a shallow marine environment of deposition. This formation thickens considerably basinward, where it is correlated with the Roma and Tambo formations.

Towards the southwestern margin of the Frome Embayment, shales of the Marree and Cadna-owie formations grade laterally into siltstones and fine-grained, well-sorted, rounded to very rounded quartz sandstones which may, in part, represent shoreline deposits.

The Mesozoic section in Fortville 3, whose locality is shown in Fig. 1, is similar in many respects to the basin-margin sequences encountered in the Frome Embayment. A log of sedimentary structures from cores in the Transition Beds and Mooga Formation in Fortville 3 is presented in Appendix A. The Transition Beds consist of a series of bioturbated siltstones and mudstones with flaser bedding and cross-laminations, plus slump structures and other soft-sediment deformation. These characteristics, in addition to the occasional presence of red beds, may indicate an intertidal-supratidal environment, consistent with interpretations of the sequence in the Frome Embayment.

A core through the Mooga Formation in Fortville 3 (Appendix A) is composed of medium to very coarse-grained, ferruginous, subrounded quartz sandstones with cross-bedding (individual set sizes average about 1 ft) and minor fining- and coarsening-upward cycles. The sandstones probably were deposited in a braided stream environment.

5. CONCLUSIONS

The Algebuckina Sandstone, Cadna-owie Formation and Marree Formation comprise the Mesozoic sequence in the Frome Embayment. The prime reference section is a fully cored sequence in Yalkalpo 1, for which palynology and petrophysical logs are available.

The Cadna-owie Formation appears to grade upwards into the Marree Formation, the contact being denoted by a general downward increase in values on the the gamma-ray log. In addition the Cadna-owie Formation is often characterized by a higher pebble content. In some wells in the northern portion of the Frome Embayment, the basal unit of the Cadna-owie Formation consists of calcareous sandstones and siltstones which may equate with the Parabarana Sandstone. Marginal marine conditions predominated during deposition of the Cadna-owie Formation, and shales and siltstones of the overlying Marree Formation and equivalents were deposited in a shallow sea.

In the Frome Embayment the top of the Algebuckina Sandstone is generally marked by a pronounced downward decrease in mica content which may partly be reflected on the gamma-ray logs; a change in source area probably is responsible. Coarse-grained sandstones deposited by braided streams predominate, although locally fine-grained (?lacustrine) facies are recognised.

In the area of the southwestern Cooper Basin the Algebuckina Sandstone is correlated with the Mooga Formation, consisting of the Namur and Murta members. These members are readily distinguishable on petrophysical logs.

The equivalent of the Cadna-owie Formation in this area, the Transition Beds, does not display significant basinward thickening, suggesting that low basinward gradients existed subsequent to deposition of the Mooga Formation. Hence these Transition Beds, which probably are of marginal-marine origin, probably were deposited during a relatively rapid transgression in a time of minor but reasonably uniform basin subsidence. However, epeirogenic movements may have been renewed during deposition of the shallow-marine sediments of the Roma and Tambo formations, which are considerably thicker than the equivalent Marree Formation of the southern basin margin.

6. ACKNOWLEDGEMENTS

The assistance of Terry Watts and Mark Griffiths of the Fossil Fuels Section in compiling this report is gratefully acknowledged.

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REFERENCES AND SELECTED BIBLIOGRAPHY

Brown, W., 1950. A micropalaeontological examination of samples, and notes on the stratigraphy of the Cootabarlow Bore No. 1. S. Aust. Dept. Mines report 28/28 (unpublished).

Brown, W., 1953. A study of the micropalaeontology and stratigraphy of five bores in the Great Artesian Basin sediments of South Australia. S. Aust. Dept. Mines report 35/54 (unpublished).

Callen, R.A., 1972. Frome Embayment stratigraphic drilling project: preliminary report on S. Aust. Dept. Mines Wooltana No. 1, Yalkalpo No. 1 and Wertaloona No. 1 stratigraphic bores. S. Aust. Dept. Mines report 72/160 (unpublished).

Callen, R.A. (Compiler), 1976. FROME, South Australia. Explanatory Notes, 1: 250 000 geological series. Sheet SH/54-10. Geol. Surv. S. Aust.

Delhi Australian Petroleum Ltd., 1968a. Well completion report, Lake Frome 1, 2 and 3. S. Aust. Dept. Mines open file Env. 968 (unpublished).

Delhi Australian Petroleum Ltd., 1968b. Tinga Tingana 1-well completion report. S. Aust. Dept. Mines open file Env. 889 (unpublished).

Dettman, M.E., 1963. Upper Mesozoic microfloras from southeastern Australia. Proc. R. Soc. Vic., 77: 1-148.

Dettman, M.E., and Playford, G., 1969. Palynology of Australian Cretaceous - a review. In: Campbell, K.S.W. (Ed): Stratigraphy and Palaeontology - Essays in honour of Dorothy Hill. A.N.U., Canberra, pp. 174-207.

Forbes, B.G., 1966. The geology of the Marree 1:250 000 map area. Rep. Invest., geol. Surv. S. Aust., 28.

Ker, D.S., 1966. The hydrology of the Frome Embayment in South Australia. Rep. Invest., geol. Surv. S. Aust., 27.

Ludbrook, N.H., 1962. Material from the southern margin of the Great Artesian Basin and the Frome Embayment. S. Aust. Dept. Mines report 55/33 (unpublished).

Ludbrook, N.H., 1966. Cretaceous biostratigraphy of the Great Artesian Basin in South Australia. Bull. geol. Surv. S. Aust., 40.

Miall, A.D., 1977. A review of the braided-river depositional environment. Earth Science Reviews, 13: 1-62.

Pexa Oil N.L., 1970a. Well completion report, Cherri 1. S. Aust. Dept. Mines open file Env. 1340 (unpublished).

Pexa Oil N.L., 1970b. Well completion report, Kumbarie 1. S. Aust. Dept. Mines open file Env. 1301 (unpublished).

Pexa Oil N.L., 1970c. Well completion report, Weena 1. S. Aust. Dept. Mines open file Env. 1456 (unpublished).

Pexa Oil N.L., 1970d. Well completion report, Gurra 1. S. Aust. Dept. Mines open file Env. 1467 (unpublished).

Stadter, M.H., and Townsend, I.J., 1972. "C" horizon, structure contour plan of southwestern Great Artesian Basin. S. Aust. Dept. Mines Special Geological Map.

Whittle, A.W. and Chebotarev, N., 1952. The stratigraphic correlation by petrographic methods applied to artesian bores in the Lake Frome area. Publs. Univ. Adelaide. Sir Douglas Mawson Anniversary Volume, pp. 185-202.

Wopfner, H. and Cornish, B.E., 1967. S.A.G. Fortville No. 3 well completion report. Rep. Invest., geol. Surv. S. Aust., 29.

Wopfner, H., Freytag, I.B., and Heath, G.R., 1970. Basal Jurassic-Cretaceous rocks of the western Great Artesian Basin, South Australia: Stratigraphy and Environment. Bull. Am. Ass. Petrol. Geol., 54: 383-416.

Youngs, B.C., 1977. Well completion report, Mudguard 1 and Yalkalpo 2. S. Aust. Dept. Mines report 77/66 (unpublished).

Youngs, B.C., 1978. Well completion report, Bumbarlow 1. S. Aust. Dept. Mines report 78/117 (unpublished).

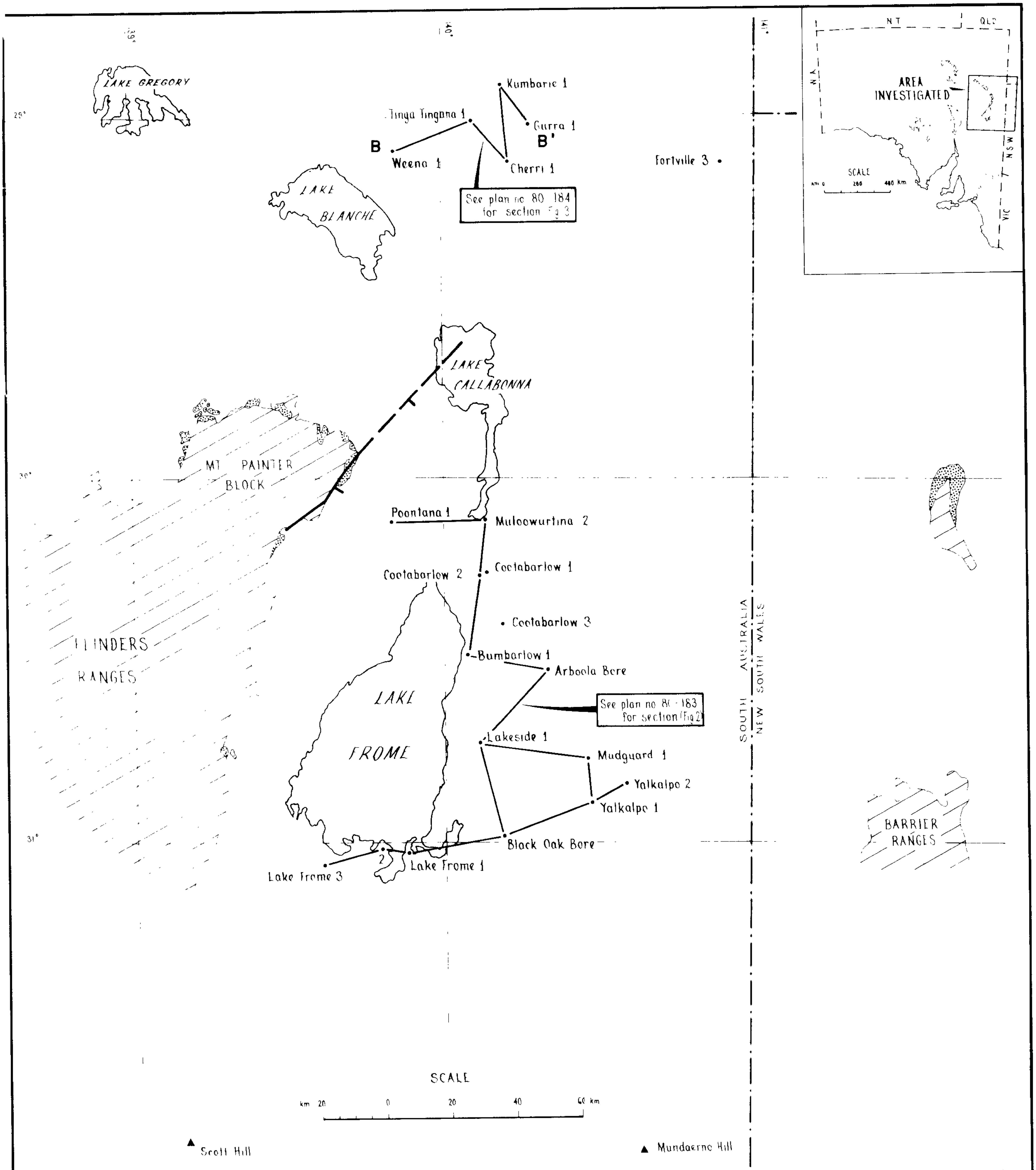


FIG 1

Cadna-Owie Formation

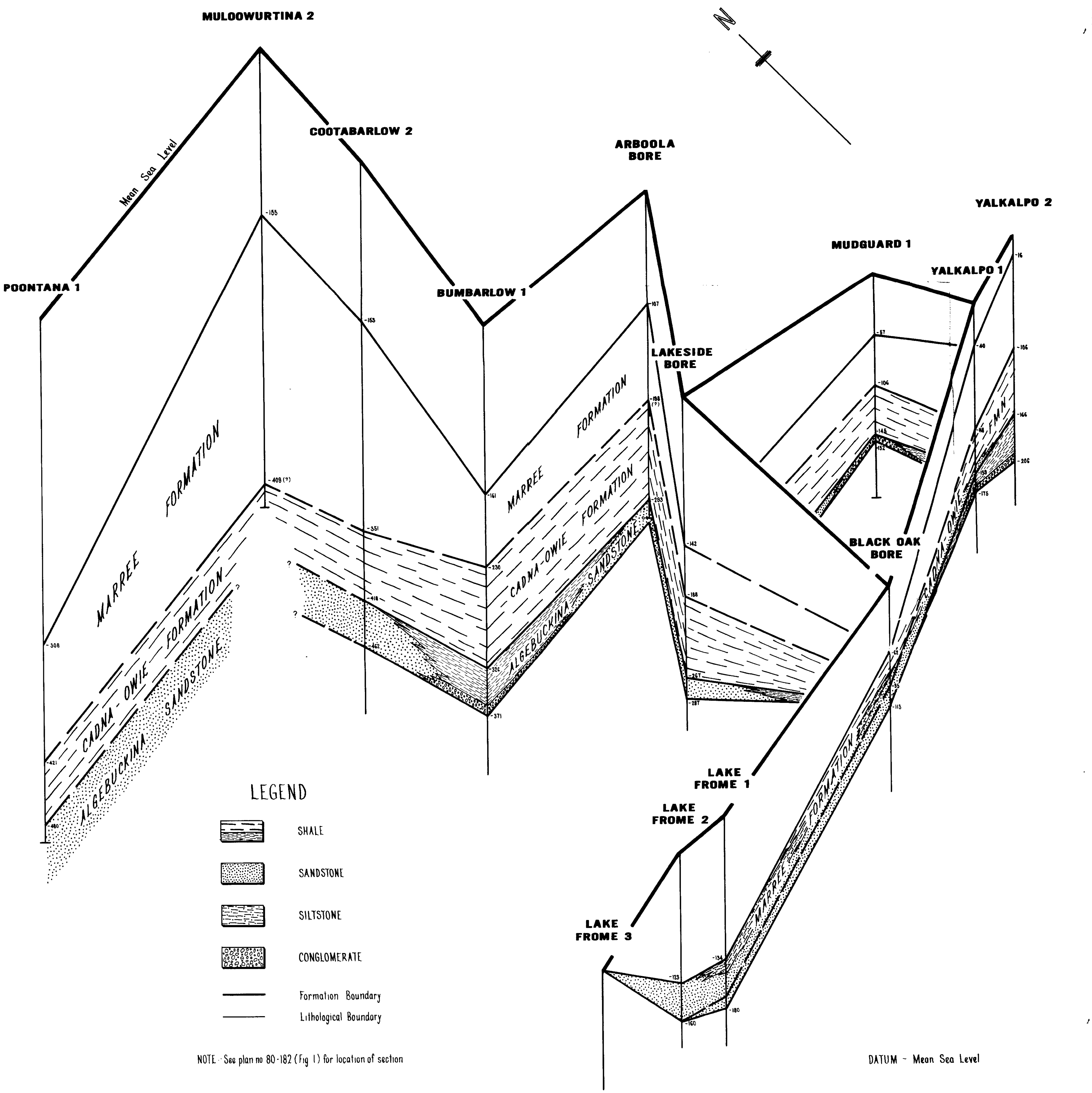
Pre Mesozoic Outcrop

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

MESOZOIC STRATIGRAPHY FROME EMBAYMENT

LOCALITY PLAN

COMPILED A J Truelove	C D O	DATE
DRAWN M R	SCALE As shown	
DATE Feb 1980	PLAN NUMBER	
CHECKED	80 - 182	



HORIZONTAL SCALE

km 5 0 5 10 15 20 25 km

VERTICAL SCALE

m 100 0 100 m

Vertical Exaggeration 125 x

FIG. 2

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED A J Truelove
	DRAWN M.R
MESOZOIC STRATIGRAPHY - FROME EMBAYMENT	DATE March 1980
	CHECKED 4.11.80
MESOZOIC SEDIMENTS - FROME EMBAYMENT ISOMETRIC CORRELATION DIAGRAM	SCALE As shown
	PLAN NUMBER 80-183

FIG. 3

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

MESOZOIC STRATIGRAPHY - FROME EMBAYMENT
SOUTH-WEST COOPER BASIN
GAMMA RAY LOG CORRELATION DIAGRAM

COMPILED A J Truelove	C D O 4-11-80	DATE
DRAWN M R	SCALE	As shown
DATE March 1980	PLAN NUMBER	
CHECKED	80 - 184	

1838

FIG 4

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

MESOZOIC STRATIGRAPHY ~ FROME EMBAYMENT

STRATIGRAPHIC CROSS-SECTION
A - A'

COMPILED	A J T.
DRAWN	M.R.
DATE	FEB 1980
CHECKED	
C.D.O. DATE	4.11.80
SCALE	As shown
PLAN NUMBER	80-185

APPENDIX A

Yalkalpo 1 - Log of core

by R.A. CALLEN

Fortville 3 Log of core

by A.J. TRUELOVE

Yalkalpo I

HOLE No. YALKALPO 1

BORE LOG

PROJECT LAKE FROME CAINOZOIC
SADM Stratigraphic drilling project
LOCATION QUINYAMBIE 1:63,360 FROME 1:250,000
near L. Yalkalpo

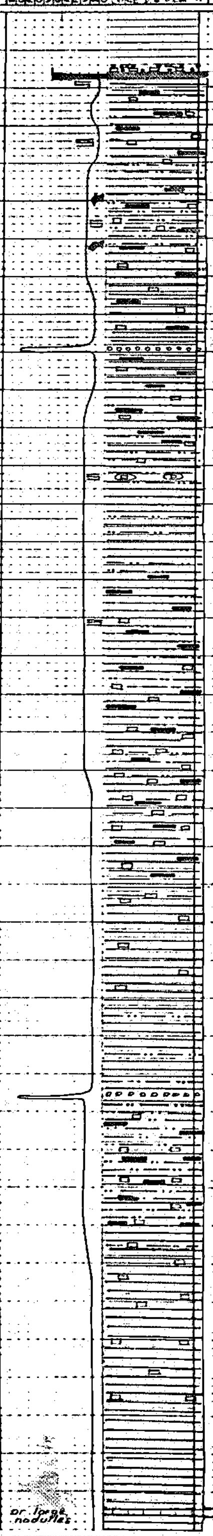
SECTION
HUNDRED

R.L. 42·5 m
T.D. 219·67 m

LAT. 30° 51' 47"
LONG. 140° 31' 58"

Columns: DEPTH (METRES) | WENTWORTH GRAIN SIZE (Boulders, Cobbles, Pebbles, Granules, SAND: VCG, CG, MG, FG, VFG, Silt, Clay) | LITHO LOG (CORE D.C. 0 cm) | INDURATION (N, S, P, C, E) | FOSSIL SOILS, WEATHERING INDURATION | % CARBONATE (75, 50, 25) | MUNSELL COLOUR | % SAND (75, 50, 25) | ROUNDNESS & SPHERICITY OF GRAINS | GRAIN SURFACE FEATURES | MINERALS (Q, M, H, F, C, Other) | SORTING (VP, P, M, W, VW) | MAX GRAIN SIZE mms | CLASTS | POROSITY (High, Medium, Low) | FOSSILS | SEDIMENTARY STRUCTURES | COMMENTS | ROCK NAME | FORMATION | SAMPLES (Pet. & Analysis) | PHOTOS

Depth scale: 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120



c. 81.5 m: Fossil soils: Solid sulphide layer. Roundness: SR-R Laws. Minerals: Thin section — Q: 85-90% mo. types; F: Rare Orth.; C: ±2405 E. Ir. (XRD) 1.5% K (ISS); Other: 8% FeS carbonaceous cement. Comments: Fs/Ps/STM/VPK Modes 1:36, 4:36 (Py?). Rock name: See above. Formation: EYRE FORMATION. Samples: 81·43 P1048/73.

c. 82–83.5 m: Munsell colour: dk. gn. gy.

c. 84 m: Minerals (M): Present

c. 86.5 m: Fossils: ☮. Comments: $P_2O_5 \leq 2\%$. Samples: 86·26 PALAEO NSW DM (RM)

c. 88 m: Minerals (M): Present. Clasts: Silt Flakes

c. 89–90 m: Clasts: gy FG gt prob. uphole contamination. Fossils: ☮. Samples: 89·58 PALAEO NSW DM (PM)

c. 91–92 m: Fossils: Plant Stem impressions. Sedimentary structures: Lenses of silt & clay; Wavy bedding. Clasts: clay Flakes

c. 92.3 m: Fossil soils: Py-Marc.

c. 99.5 m: Fossils: ☮. Samples: 99·44 PALAEO NSW DM (RM)

c. 103–107 m: Munsell colour: NOT RECORDED. % Sand: NOT RECORDED. Sorting: NOT RECORDED. Porosity: NOT RECORDED.

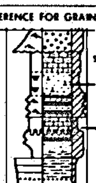
c. 108.5 m: Roundness: VWR. Grain surface features: Smooth. Minerals (M): common. Clasts: Sort? Gy. chert with recemented fractures of 2nd 3 ages. Breihanter shape. Only 1 pebble. Prob. uphole contamination

c. 114.5 m: Fossils: ☮. Samples: 114·4 PALAEO NSW DM (RM)

c. 119.5 m: Wentworth: or large nodules. Fossil soils: Carbonate Nodules ? Calcite/Siderite. Minerals: Q: Scattered grains; H/F: Thin Section; C: K&S?; Other: Calcite xtls elongate in same direction. Samples: 119·40 P1021/73

Rock name: ALTERNATING CARBONACEOUS SILT AND CLAYSTONE
Formation: MARREE FORMATION

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



DRG No 75-563b YALKALPO 1

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column
Induration code: Use own code & specify here or on separate sheet
Cement, etc.: Use symbol code
% Carbonate: State method
% Sand: State method
Roundness: Use Powers scale
Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Hemphill's) pp 103–105
VP = very poor, P = poor, M = moderate, W = well, VW = very well
Porosity: State type (whether interconnected pores or not)

Q Quartz
M Mica
H Heavies
F Feldspar
C Clays
Other Other minerals

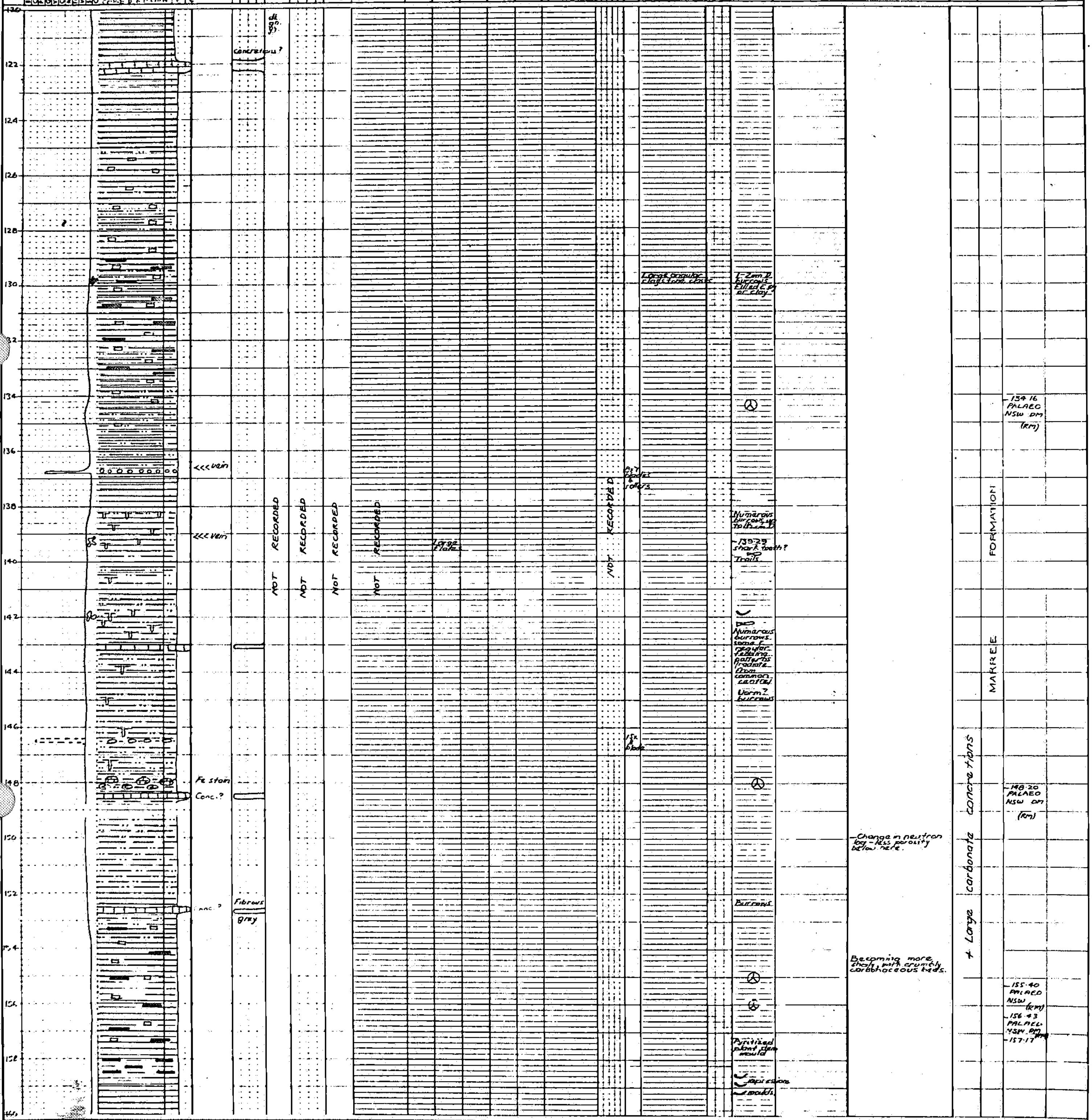
LOGGED BY RAC | DATE 1973
TRACED BY AP | DRAFTING BRANCH
DEPARTMENT OF MINES SOUTH AUSTRALIA
CHECKED | SHEET 3 OF 6

HOLE No. YALKALPO 1

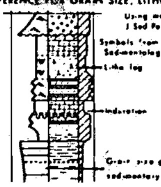
BORE LOG

PROJECT LAKE FROME CAINOZOIC SADM Stratigraphic drilling project
LOCATION QUINYAMBIE 1:63,360 FROME 1:250,000 near L. Kalkalpo
SECTION
HUNDRED
R.L. 42·6m
T.D. 219·67
LAT. 30° 51' 47"
LONG. 140° 31' 58"

DEPTH (METRES) | WENTWORTH GRAIN SIZE (Boulders, Cobbles, Pebbles, Granules, SAND: VCG, CG, MG, FG, VFG, Silt, Clay) | LITHO LOG | INDURATION (S, C, P, Z) | FOSSIL SOILS, WEATHERING, INDURATION | % CARBONATE (75, 50, 25) | MUNSELL COLOUR | % SAND (75, 50, 25) | ROUNDNESS & SPHERICITY OF GRAINS | GRAIN SURFACE FEATURES | MINERALS (Q, M, H, F, C, Other) | SORTING | MAX GRAIN SIZE mm | CLASTS | POROSITY (High, Medium, Low) | FOSSILS | SEDIMENTARY STRUCTURES | COMMENTS | ROCK NAME | FORMATION | SAMPLES (Pet & Analysis) | PHOTOS



REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



YALKALPO 1
DRG No 75-553c

NOTES
Sedimentary Structures: Use column for details, place symbol in grain size column
Induration code: Use own code & specify here or on separate sheet
Cement, etc.: Use symbol code
% Carbonate: State method
% Sand: State method
Roundness: Use Power's scale
Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Hemphills) pp 103–105
VP = very poor, P = poor, M = moderate, W = well, VW = very well
Porosity: State type (whether interconnected pores or not)

Q Quartz
M Mica
H Heavies
F Feldspar
C Clays
Other Other minerals

LOGGED BY RAC | DATE 1973
TRACED BY AR | DRAFTING BRANCH
DEPARTMENT OF MINES SOUTH AUSTRALIA
CHECKED | SHEET 4 OF 6

BORE LOG

PROJECT LAKE FROME CAINOZOIC SADM Stratigraphic drilling project

LOCATION QUINYAMBIE 1:63,360 FROME 1:250,000 near L. Yalkalpo

SECTION

HUNDRED

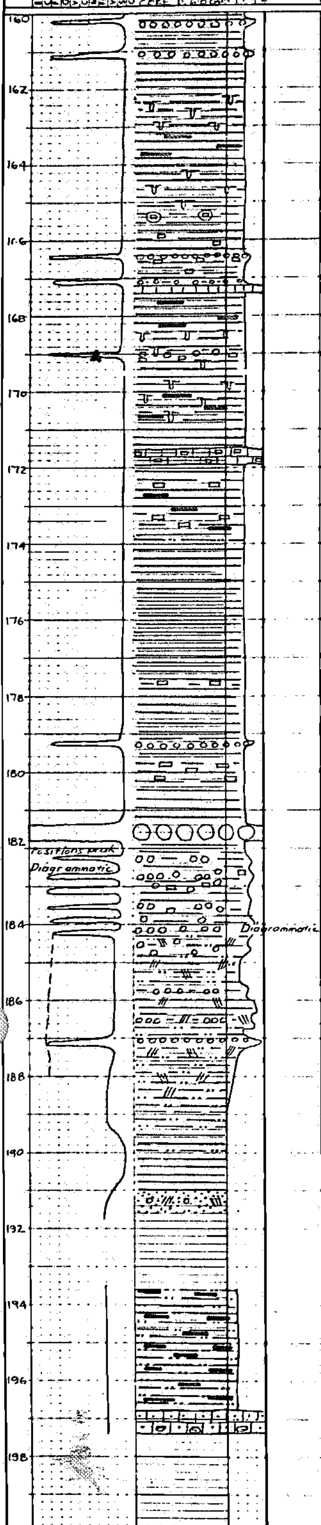
R.L. 42·8m

T.D. 219·67

LAT. 30° 51' 47"

LONG. 140° 31' 58"

Columns: DEPTH (METRES) | WENTWORTH GRAIN SIZE (Boulders, Cobbles, Pebbles, Granules, SAND VC C M F VF, Silt, Clay) | LITHO LOG | INDURATION (S C / N P E) | FOSSIL SOILS, WEATHERING, INDURATION | % CARBONATE (75 50 25) | MUNSELL COLOUR | % SAND (75 50 25) | ROUNDNESS & SPHERICITY OF GRAINS | GRAIN SURFACE FEATURES | MINERALS (Q, M, H, F, C, Other) | SORTING | MAX GRAIN SIZE mms | CLASTS | POROSITY (High, Medium, Low) | FOSSILS | SEDIMENTARY STRUCTURES | COMMENTS | ROCK NAME | FORMATION | SAMPLES | Pet & Analysis | PHOTOS



Depth (m)	Max grain size	Clasts	Fossils	Comments	Samples
160	19x11	chert			
160–161	30x	Gn shale & gy porphyry. Lens shaped cobble broken from large disc			
162.5			Burrows		
164–165			Brachiopod bored branches; Burrows		
166			crustacean carapace frag??	?	
166.5	24x20	gn. shale, gy chert, wh. f.G. rock, pink qtz, volcanics. Polished			
167.5					167·49 P1023/73
169	~55x20	Intraformational breccia frags.	Burrows		
171.5–172				Coarsely crystalline, with patches of shale	172·20 PALAEO NSW DM (PM)
176				Claystone, but becomes shaly on exposure to air.	
180.5–181.5		Red-brn. porphyry chips		Boulders pushed ahead by drill	180·65 PALAEO NSW DM (PM)
185		Red porphyry pebbles c wh. feldspars			
187		T/S Q-Plag-KF Rhyolite porphyry.			187·15 P1024A/73
190.5				Very soft.	190·85 PALAEO NSW DM (PM)
195.5–196.5		T/S Porphyritic rhyolite c ?? vains c.f. DUD. BORE.			195·48 PALAEO NSW DM (PM)
197.5		Chalk pebbles at base			
199.5		Porphyry pebbles.			P1024B/73 199·94

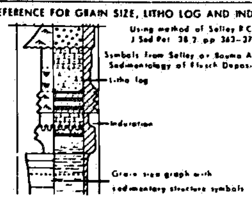
Munsell colour, % sand, roundness, grain surface features (182–186 m): NOT RECORDED

Sorting (183–186 m): NOT RECORDED; Max grain size: VERY COARSE

ROCK NAME: PEBBLY CLAYSTONE (160–181 m); CARBONACEOUS PEBBLY & COBBLY SILT (181–197 m); SANDY LIMESTONE (197 m); CARBONACEOUS PEBBLY & COBBLY SILT & SAND (197–200 m)

FORMATION: ? ; CADNA-OWIE FORMATION; CADNA-OWIE FORMATION EQUIVALENT ?

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



DRG No 75-553d YALKALPO 1

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Hemphill's) pp 103-105. VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

Q	Quartz
M	Mica
H	Heavies
F	Feldspar
C	Clays
Other	Other minerals

LOGGED BY R.A.C. DATE 1973

TRACED BY AP DRAFTING BRANCH DEPARTMENT OF MINES SOUTH AUSTRALIA

CHECKED

SHEET 5 OF 6

HOLE No. YALKALPO 1

BORE LOG

PROJECT LAKE FROME CAINOZOIC
SADM Stratigraphic drilling project

LOCATION QUINYAMBIE 1:63,360 FROME 1:250,000
near L. Yalkalpo

SECTION

HUNDRED

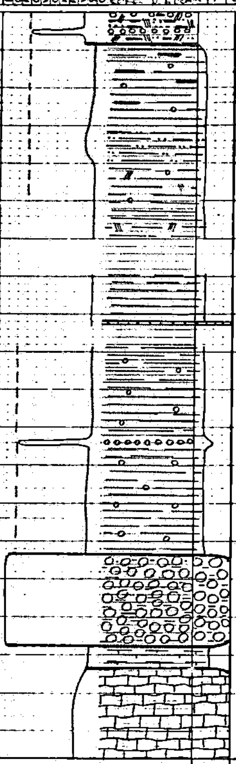
R.L. 42.5m

T.D. 219.67m

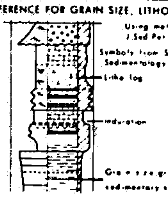
LAT 30° 51' 47"

LONG. 140° 31' 58"

DEPTH (METRES)	WENTWORTH GRAIN SIZE (Boulders, Cobbles, Pebbles, Granules, VCG, CG, MG, FG, VFG, Silt, Clay) / LITHO LOG	INDURATION (S, C / N, P, E)	FOSSIL SOILS, WEATHERING, INDURATION	% CARBONATE	MUNSELL COLOUR	% SAND	ROUNDNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS (Q, M, H, F, C, Other)	SORTING	MAX GRAIN SIZE mm	CLASTS	POROSITY (High, Medium, Low)	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	CAINOZOIC FORMATION EQUIVALENT	SAMPLES Pet & Analysis	PHOTOS
200	CORE D 6 cm																Sec. above			
201														⊗					201.20 PALAEO NSH Lm (Rm)	
202–208			Q crystals & py. veins		NOT RECORDED	NOT RECORDED	NOT RECORDED	NOT RECORDED		NOT RECORDED							PEBBLY CLAYSTONE	ALGEBUCKINA SANDSTONE EQUIVALENT		
209												Shale (as gy & pink) porphyry & qt pebbles								
210–211												1+ gy VFG qt		⊗				JURASSIC CRETACEOUS Boundary	210.59 PALAEO NSH Lm (Pm)	
214–216						Matrix 5%	VR shale often broken					Pink porphyry, contorted marble, bl-gn shale, brown, tidely & bedded gt, bn shale. Matrix coarse sand of porphyry, F & Q with matrix of shale as above		⊗		CUTTINGS – NO CORE (1.04m). Depths 2m out according to Neutron Log.	Shaly & Sandy PORPHYRY PEBBLE CONGLOMERATE	J – UK UNAMED	214.72 PALAEO; PALAEO	
217					rd & gr												Red & gn SHALE			
217–219														15cm Trilobite		Nodular	NODULAR GREY LIMESTONE	CAMBRIAN (N.E.?)	217.40 PALAEO U.A (Bu)	
220	END OF HOLE 219.68 m																			



REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column
Induration code: Use own code & specify here or on separate sheet
Cement, etc: Use symbol code
% Carbonate: State method
% Sand: State method
Roundness: Use Powers scale
Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Hemphill's) pp 103–105
VP = very poor, P = poor, M = moderate, W = well, VW = very well
Porosity: State type (whether interconnected pores or not)

Q Quartz
M Mica
H Heavies
F Feldspar
C Clays
Other Other minerals

YALKALPO 1, DRG No 75-553 a

LOGGED BY R.A.C.	DATE 1973
TRACED BY A.R.	DRAFTING BRANCH DEPARTMENT OF MINES SOUTH AUSTRALIA
CHECKED	SHEET 6 OF 6

APPENDIX B

Cuttings logs from the Frome
Embayment wells

Arboola Bore
Black Oak Bore
Bumbarlow 1
Cootabarlow 1
Cootabarlow 2
Cootabarlow 3
Lake Frome 1
Lake Frome 2
Lakeside Bore
Poontana 1
Yalkalpo 2

by A.J. TRUELOVE

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA

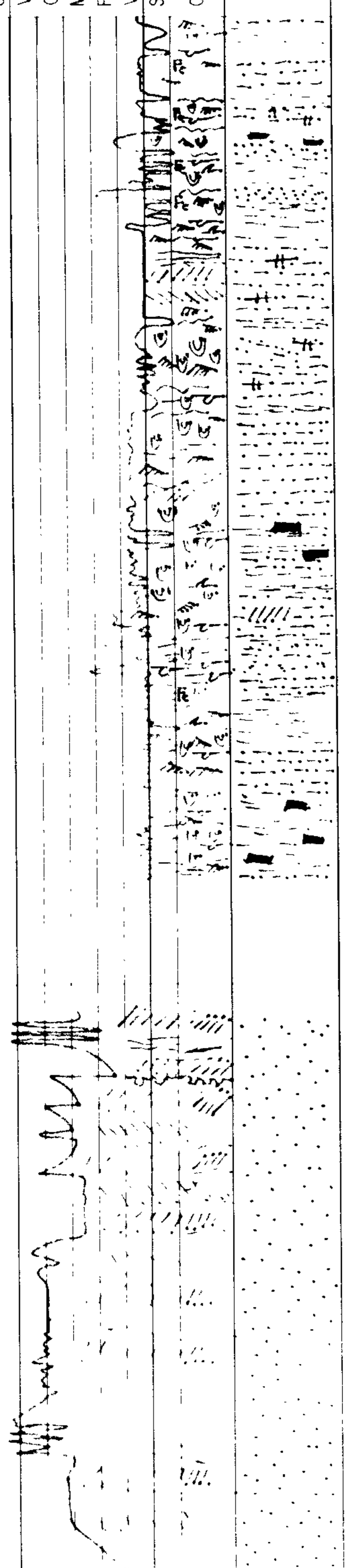
MF 94

CORE LOG (imperial)

WELL NAME / NO. Fortville 3 | LAT. | I-MILE SHEET | LOGGER/DATE A.J.Troelson ? Jan. 1990 | K.B. | SPUD DATE | T.D. (DRILLER)

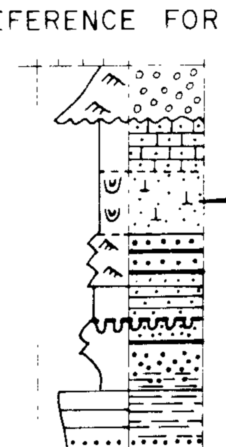
PROJECT | LONG. | 4-MILE SHEET | DEPTH INTERVAL | GROUND EL. | COMPLETION DATE | T.D. (LOGGER)

BIT RECORD CASING PLUGS TESTS | CORING RATE (minutes per foot) (25) (30) (35) 0 5 10 15 20 | RECOVERY LOG | SHOWS: VISOIL, VISTAIN, SAMFLUOR, SOLFLUOR, SOLCUT | GRAIN SIZE (Wentworth): BOULDER, COBBLE, PEBBLE, GRANULE, SAND: VCG, CG, MG, FG, VFG, SILT, CLAY | LITHO LOG (or % cuttings) | COLOUR | DEPTH | FRAMEWORK: % 25 50 75; TYPE: Q, RF, F, COy, HM; ROUNDNESS: VA, A, SA, SR, R, VR; SORTING: VP, P, MW, W, VW, M | POROSITY: TIGHT, POOR, FAIR, GOOD, V GOOD, VUG | Ø TYPE: INT GRAN, INT PART, INT XL, INT SK | MATRIX: % 25 50 75; DETRITAL: CLAY, SILT; CEMENT: CALCITE, SILICA | ACCESSY: PYRITE, MICA, GLAUC, COAL, KAOLIN | CLASTS | SEDIMENTARY STRUCTURE (Graphic representation in Selley log) | ENVIRONMENTAL INTERPRETATION | ROCK NAME | COMMENTS (Weathering, induration, grain surface features, etc) | UNIT Snd Sh | BIO-STRATIGRAPHY | ROCK STRATIGRAPHY: SUB UNIT, UNIT, MEMBER, FORMATION, GROUP, AGE | SAMPLE Sample No.



Depth	Clasts	Sedimentary structure	Environmental interpretation	Comments
2920'	Fe-stone(?)	Slumping, soft sediment faults, bioturbation, ball & pillow		Mica in muddy layers, few vcg quartz grains. Massive Sst. Bioturbated red bed - subaerial exposure. Red Bed. Red Bed. Ferruginous clasts - may be a slump with ferruginisation around the margins
	Fe-stone			
	5cm clast of same lithology as matrix	Finely laminated sand, silt + clay. Microfaults. Intraformational, imbricate clay pebbles		Planar bedded silt, minor mud
2925'		Bioturbation. Intraformational mud pellets. Ball & pillow. Massive - some very faint laminae. Bioturbation pronounced	Marginal Marine	Silt with very fine laminae of mud
2930'		Ball & pillow		Black carbonaceous mud. Minor ? 1%. Minor Fe staining
		Red Bed		
		Trough X-bed. Slumping common. Highly bioturbated		
2935'				
3320'		Massive. X-bedded in places. Ferruginous ...		Kaolinitic ... sst. Ferruginous ... sst. ... with ... layers - X-bedding. Minor ... ... bands
				... of ...
3325'	... pebble		Braided River	
	... pebbles			Ferruginous ? ...
3330'				

REFERENCE FOR GRAIN SIZE AND LITHO LOG



Using method of Selley R.C., 1968
J. Sed Pet. 38(2) pp. 363-372
Symbols from Selley or Bouma A.H., 1962
"Sedimentology of Flysch Deposits" (Elsevier)
also cf. Selley, R.C. (1978)
"Ancient Sedimentary Environments" (2nd ed.) (Chapman & Hall)

Colour: use the G.S.A. Rock Colour Chart based on the Munsell System

Sedimentary Structures: use column for written details, place symbol in grain size column

Framework Type: Q = quartz RF = rock fragments F = feldspar COy = carbonate HM = heavy minerals

Roundness: using Power's scale
VA = very angular A = angular SA = sub angular SR = sub rounded R = rounded VR = very rounded

Sorting: based on Folk, R. (1968) "Petrology of Sedimentary Rocks" (Hemphill's) pp 103-105
VP = very poor P = poor MW = moderately well W = well sorted VW = very well sorted M = modal sorting

Porosity Type: state whether pores are interconnected or not.

SHEET NO. OF

DEPARTMENT OF MINES AND ENERGY-SOUTH AUSTRALIA

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

MF 78

WELL COMPANY / NAME / NO. [illegible] KB GEI. LOGGER/DATE [illegible] DEPTH FROM TO

Column headings: % Cuttings (0 50% 100) | COLOUR | GRAIN SIZE (CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V. COARSE, V. COARSE +) | SORTING (VERY POOR, POOR, MOD. WELL, WELL, VERY WELL, MODE) | DEPTH | ROUNDNESS (V. ANG., ANG., SUB ANG., SUB RND., ROUNDED, V ROUNDED) | VIS. POROSITY (TIGHT, POOR, FAIR, GOOD, VERY GOOD) | POROSITY TYPE (VUG, INT. GRAN, INTERPART, INT. XL, INT. SK) | FRAMEWORK (QUARTZ, ROCK FR, FELDSP., CARBONATE) | ACCESS (PYRITE, MICA, GLAUC) | MATRIX: DETRITAL (CLAY, SILT), CEMENT (CALCITE, SILICA) | MTX TEXT. (COMPACT, FRIABLE, SUCROSIC, REXL.) | % FRAMEWORK | SHOWS | CORES SWC's | INTERP LOG | DST | SOURCE ROCK POT. | ENVIRONMENT INTERP. | REMARKS | UNIT % FRAMEWORK | UNIT Snd:Sh | STRATIGRAPHY (SUB UNIT, UNIT, MEMBER, FORMATION, GROUP, AGE)

[illegible]

Positions 1

Colour	Depth	Remarks
brn	880'-906'	Unsorted veg sst (qtz
"	906-1018	c.g. qtz sst, med-well sorted, clean, some silt
l.gy	1018-1070	sand(AA) + pyritic Mudstone, mica common, pyrite patches
"	1070-1110	Sand(AA) + silty Mudstone rich in mica, pyrite + carbon, a nodule of pyrite
"	1110-1125	" + Mottled silt + mud(AA) · concretionary [illegible]
..	1125-1190	Sand, qtz [illegible]
"	1190-1225	sand (AA) [illegible]
"	1225-[illegible]	[illegible]
gy	[illegible]	[illegible]
"	1300-1326	AA - much qtz less [illegible]
gy	1326-1360	mudstone, mica + carbon.
gy	1360-[illegible]	[illegible]
gy-r/brn	14..-1425	[illegible] mostly [illegible].
"	1425-1440	AA [illegible]
"	1440-1495	Mudstone with qtz grains common (2%)
"	1495-1540	Int. silt + clay (Flame [illegible] structures) [illegible]
"	1540-1600	AA - less [illegible], elongate [illegible]
"	1600-1632.	AA - silt [illegible] common
mott	1632-16..	Unconsol[illegible] [illegible]
"	16..-16..	AA - less pebbles + granules, more Fe
"	163.-1639	AA - [illegible]
rd	16..-16..	F-M qtz sst, many pink qtz, Fe, some silt peak
y/pk/brn	16..-1649	AA - more yellow qtz, Fe, some silt pebbles
y/brn	16..-16..	AA - more Fe
y	16..-165.	AA - mainly yel qtz Fe
pk	1655-1677	AA - more pk qtz, [illegible] Fe, [illegible] silt
y/pk	16..-1695	AA - y + pk qtz
pk	1695-1712	AA - mainly pk qtz

Stratigraphy:

Formation	Age
?	Tert.
Morree Fm	Cretaceous
Cadna-owie	Cretaceous
Algebuckina Sst	Jurassic

JOB NO 1444

DEPARTMENT OF MINES AND ENERGY-SOUTH AUSTRALIA

MF 78

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

WELL COMPANY / NAME / NO. [illegible] KB GEI. LOGGER/DATE [illegible] DEPTH FROM TO

Column headings: % Cuttings (0 50% 100) | COLOUR | GRAIN SIZE (CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V. COARSE, V. COARSE +) | SORTING (VERY POOR, POOR, MOD WELL, WELL, VERY WELL, MODE) | DEPTH | ROUNDNESS (V ANG., ANG., SUB ANG., SUB RND., ROUNDED, V. ROUNDED) | VIS. POROSITY (TIGHT, POOR, FAIR, GOOD, VERY GOOD) | POROSITY TYPE (VUG, INT. GRAN, INTERPART, INT. XL, INT. SK) | FRAMEWORK (QUARTZ, ROCK FR., FELDSP., CARBONATE) | ACCESS (PYRITE, MICA, GLAUC., [illegible]) | MATRIX DETRITAL (CLAY, SILT) | MATRIX CEMENT (CALCITE, SILICA) | MTX TEXT. (COMPACT, FRIABLE, SUCROSIC, REXL.) | % FRAMEWORK | SHOWS | CORES SWC's | INTERP LOG | DST | SOURCE ROCK POT. | ENVIRONMENT INTERP. | REMARKS | UNIT % FRAMEWORK | UNIT Snd : Sh | STRATIGRAPHY (SUB UNIT, UNIT, MEMBER, FORMATION, GROUP, AGE)

Depths marked: 195m, 210m, 225m, 240m, 255m, 270m, 285m, 300m, 315m, 330m, 345m, 360m, 375m (Changes drilling), 390m, 405m

REMARKS

- v.f.g. sand [illegible]
- AA [illegible]
- silty mudstone - some coarse qtz sand grains
- AA some white dolomite
- AA
- AA
- AA
- AA
- AA - some pebbles, more [illegible]
- AA - [illegible]
- AA
- AA
- AA - some white [illegible]
- AA - more silt
- dark carbonaceous siltst. and [illegible]
- AA - white patches [illegible]
- AA
- AA
- AA - [illegible] pebble
- AA
- AA
- AA
- AA - more carbon [illegible]
- AA - lot of mica
- AA - some bands of siltstone, mud becomes harder
- AA silt + mud pebbles, [illegible]
- AA - [illegible]
- [illegible]
- silt and fine [illegible] qtz grains [illegible] pebble
- AA
- AA - pebble of [illegible]
- AA - [illegible] present
- AA some [illegible]
- AA - [illegible]
- AA
- [illegible] AA - some [illegible]
- AA
- AA - [illegible]
- AA
- AA
- AA [illegible]
- AA - some [illegible] pebble
- AA - [illegible]
- AA
- AA
- AA
- AA [illegible]
- AA - [illegible]
- AA - [illegible]
- silty mud [illegible] qtz grains
- AA more [illegible]
- AA - pebble of hard [illegible] siltstone
- AA - [illegible]
- AA
- AA - [illegible]
- AA - lot of mica, no pebble
- AA - more mica, [illegible] pebbles
- AA - harder [illegible]
- AA - some white clay, some yellow clay, some [illegible]
- AA - some soft white clay
- AA - not hard - [illegible] some white
- AA
- AA - some qtz [illegible]
- AA
- AA - slightly harder
- AA - [illegible] qtz pebble
- AA
- AA - harder, pebbles of qtz [illegible]
- AA - more pebbles, some [illegible]
- [illegible]
- AA [illegible] pebbles [illegible]
- [illegible] clay [illegible] with [illegible]
- AA
- [illegible] clay [illegible]

STRATIGRAPHY

Formation	Age
Murree Fm.	Tert
Cadna-owie Fm	[illegible]
Algebuckina Sst.	Jurassic
?	P?

JOB NO. 1444

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA

MF 78

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

WELL COMPANY / NAME / NO. Lake Frome 1   KB   GEI.   LOGGER/DATE   DEPTH FROM   TO

Column headings: % Cuttings (0 50% 100) | COLOUR | GRAIN SIZE (CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V COARSE, V COARSE +) | SORTING (VERY POOR, POOR, MOD WELL, WELL, VERY WELL, MODE) | DEPTH | ROUNDNESS (V. ANG., ANG., SUB ANG., SUB RND., ROUNDED, V ROUNDED) | VIS. POROSITY (TIGHT, POOR, FAIR, GOOD, VERY GOOD) | POROSITY TYPE (VUG, INT. GRAN, INTERPART, INT. XL, INT SK) | FRAMEWORK (QUARTZ, ROCK FR, FELDSP., CARBONATE) | ACCESS (PYRITE, MICA, GLAUC) | MATRIX: DETRITAL (CLAY, SILT), CEMENT (CALCITE, SILICA) | MTX. TEXT. (COMPACT, FRIABLE, SUCROSIC, REXI) | % FRAMEWORK | SHOWS | CORES SWC's | INTERP LOG | DST | SOURCE ROCK POT. | ENVIRONMENT INTERP | REMARKS | UNIT % FRAMEWORK | UNIT Snd:Sh | STRATIGRAPHY (SUB UNIT, UNIT, MEMBER, FORMATION, GROUP, AGE)

Lake Frome 1

Colour	Depth	Remarks
Car	360'	Post Mesozoic Calc. sst + lst
"		AA - mainly v. soft lst (Like kunkar)
"		AA
..		AA
blk	400'	Black carbonaceous, micaceous, silt + mudstone (strongly cont)
"		AA - few qtz granules + calcite grains
" Lg		AA - more carbonate
rd/blk		AA - quite a lot of qtz sand
blk/cn		Sst - unsorted, well rounded, with some lith. & carbonaceous
cn/blk	450'	AA
gy		AA - qtz abundant - milky
lgy		AA - much more silt + mica + mudstone
"		AA.
"		AA - less mica
"	500'	AA
"/cn		Fine qtz sst with coarse grained fragments
"		AA
cn		AA - finer grained - mostly vfg + silt
"		AA
"	550'	AA - some clay + Fe staining
wh		AA
cn/gy		AA - mainly silt + vfg sand, some Fe staining
wh/cn		v. clean pure qtz. fine grained sst., clear milky qtz
"		AA - finer parts.
"	600'	AA - quite a lot of pyrite (5%), some ass. with qtz
gy		Highly calc. siltstone + some mudstone
cm		silty lst with heavy minerals + large qtz granules
..		AA - silt, v. hard
"		AA - some sparry calcite
cn/wh		AA - some chert, agate, porphyry? pebble
		As 600' but a lot of calcite grains

Stratigraphy: Tertiary; Cadna-owie or Marree — Mesozoic; Є

Marree?

L. Frome

Colour	Depth	Remarks
cm	390'	V. clean pure, f.g., qtz sst
"	400'	AA - v.f.g. - f.g.
"	410'	AA
..	420'	AA - some calc silt
"	430'	AA
..	440' (450'-490' ...)	AA
..	500' (500'-550' ...)	Unsorted qtz sst, pebble of red sst, silt
"	560'	AA
"	570'	AA

Stratigraphy: Tert; Mesoz.; Є

JOB NO 1444

MF 78

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

WELL COMPANY / NAME / NO. [illegible] 1   KB   GEI.   LOGGER/DATE [illegible]   DEPTH FROM   TO

% Cuttings (0 50% 100)	COLOUR	GRAIN SIZE (CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V COARSE, V COARSE +)	SORTING (VERY POOR, POOR, MOD. WELL, WELL, VERY WELL, MODE)	DEPTH	ROUNDNESS (V ANG, ANG, SUB ANG, SUB RND, ROUNDED, V ROUNDED)	VIS. POROSITY (TIGHT, POOR, FAIR, GOOD, VERY GOOD)	POROSITY TYPE (VUG, INT GRAN, INTERPART, INT XL, INT SK)	FRAMEWORK (QUARTZ, ROCK FR, FELDSP, CARBONATE)	ACCESS (PYRITE, MICA, GLAUC)	MATRIX DETRITAL (CLAY, SILT)	MATRIX CEMENT (CALCITE, SILICA)	MTX TEXT. (COMPACT, FRIABLE, SUCROSIC, REXL)	% FRAMEWORK	SHOWS	CORES SWC's	INTERP. LOG	DST	SOURCE ROCK POT.	ENVIRONMENT INTERP	REMARKS	UNIT % FRAMEWORK	UNIT Snd - Sh	STRATIGRAPHY: SUB UNIT	UNIT	MEMBER	FORMATION	GROUP	AGE

REMARKS (handwritten, largely illegible):

- [illegible]
- AA pebbles [illegible]
- [illegible]
- AA
- [illegible]
- AA small amount of [illegible]
- AA [illegible]
- AA [illegible] more qtz sand
- sandy [illegible]
- AA
- AA
- [illegible] pebble
- AA more silty
- AA [illegible]
- AA [illegible]
- AA [illegible] qtz [illegible]
- AA more silt sized part.
- Silt with occ. [illegible] qtz
- AA [illegible]
- [illegible]
- AA
- AA
- AA
- AA
- AA pebbles of dolomite [illegible]
- AA [illegible] qtz dolomite [illegible]
- silty [illegible] some qtz grain
- AA
- siltstone [illegible]
- AA
- siltstone
- AA
- AA
- AA
- [illegible]
- AA [illegible] pebble [illegible]
- AA
- [illegible]
- AA [illegible] rounded
- AA
- AA
- AA more silt
- AA more [illegible]
- AA
- [illegible]
- AA [illegible] dolomite
- AA
- AA
- AA [illegible] dolomite
- AA
- AA
- AA
- AA
- [illegible] silty mudstone
- AA silty [illegible]
- AA no [illegible]
- AA granule of [illegible]
- AA [illegible]
- [illegible] silty mudstone
- mudstone
- AA [illegible]
- AA
- AA
- AA
- [illegible]
- AA
- AA
- AA some [illegible]
- AA some [illegible]
- AA more silty, [illegible] pebble [illegible]
- AA more [illegible], [illegible] Fe [illegible]
- AA large [illegible]
- [illegible]
- AA [illegible] dolomite pebbles
- AA [illegible], minor [illegible]
- AA [illegible] large [illegible]
- AA [illegible]
- AA
- [illegible] mudstone, some coarse sand qtz [illegible]

STRATIGRAPHY (handwritten): Tert. ; Marree Fm. ; ? ? ? ; Cadna-owie Fm.

JOB NO. 1444

DEPARTMENT OF MINES AND ENERGY-SOUTH AUSTRALIA

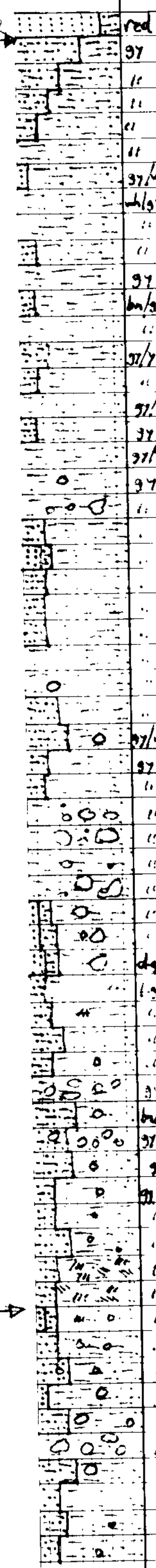
MF 78

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

WELL COMPANY / NAME / NO. KB GEI. LOGGER/DATE DEPTH FROM TO

% Cuttings	COLOUR	GRAIN SIZE	SORTING	DEPTH	ROUNDNESS	VIS POROSITY	POROSITY TYPE	FRAMEWORK	ACCESS	MATRIX (DETRITAL / CEMENT)	MTX. TEXT.	% FRAMEWORK	SHOWS	CORES SWC's	INTERP LOG	DST	SOURCE ROCK POT	ENVIRONMENT INTERP.	REMARKS	UNIT % FRAMEWORK	UNIT Snd : Sh	STRATIGRAPHY
0 50% 100		CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V. COARSE, V COARSE +	VERY POOR, POOR, MOD. WELL, WELL, VERY WELL, MODE		V. ANG, ANG, SUB ANG, SUB RND, ROUNDED, V. ROUNDED	TIGHT, POOR, FAIR, GOOD, VERY GOOD	VUG, INT. GRAN, INTERPART, INT XL, INT SK	QUARTZ, ROCK FR., FELDSP., CARBONATE	PYRITE, MICA, GLAUC	CLAY, SILT / CALCITE, SILICA	COMPACT, FRIABLE, SUCROSIC, REXL.											SUB UNIT, UNIT, MEMBER, FORMATION, GROUP, AGE

Yalkalpo 2



REMARKS:

Sst (Tert) - Qtz with some silt
grey calc. silty pebbly mudstone
slightly calc silty mudstone
silty mudstone - calc pebbles
mudstone, some dk bn carbonaceous
mudstone, some white, some dk carbonaceous, some Fe stained
AA - some mottled
AA - mould of bivalve?
AA
grey mudstone (dk - carbon?)
Silty mudstone with some yellow staining
AA
AA - more silty, yellow staining common
AA - some calc grains
AA
AA
AA - more yellow clayst.
AA - very coarse grain of qtz
AA - some silt pebbles ≈ 2cm
AA
AA
AA with some ma' qtz sst
AA with hematite granules
AA
AA
Mudstone
AA - clear qtz grain (v. coarse)
Silty mudstone
AA - clear qtz granule, white clay granule
AA
AA - some Fe granules
AA - some granules of similar lithology to matrix
Conglomerate - mudstone pebbles in mud matrix - pebbles rounded, diameter (silty)
AA - less pebbles, some coarse qtz grains - granules
AA - some pebbles of silt
AA - less pebbles, some fine qtz grains 5%) angular
AA - pebble (1cm?) of v. hard chert banded, heavy minerals
AA - some pebbles of fine hard, calc, sep.s
Silty mudstone - some dark carb mudstone, some mica
AA - more silt, more small mica flakes
AA - occasional siltstone pebble
AA - calc fine sst pebble, less mica
Silty mudstone pebbles in mudstone matrix - granules
Silt + mudstone - some calc pebbles + silty pebbles
AA - more silt pebbles + mica
AA - v. few pebbles
AA - occ. v. small granule of silt
AA
AA
AA - first major mica, some calc granules (SHOWS: * Major Mica)
AA
AA - some med grained, calc, micaceous sst - less mica (SHOWS: * Much less Mica)
AA
AA
Mudstone, some black carbonaceous mud
AA - some silty patches + pebbles
AA - many large silt pebbles
AA - less pebbles
Mudstone, calcareous, micaceous
AA - some coarse qtz grains
AA

STRATIGRAPHY:

Marree Fm — Cretaceous
Cadna-owie Fm — Cretaceous
Algebuckina Sst. — Jurassic
? ?

JOB NO 1444

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA

MF 78

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

WELL COMPANY / NAME / NO. KB GEL LOGGER / DATE DEPTH FROM TO

% Cuttings	COLOUR	GRAIN SIZE	SORTING	DEPTH	ROUNDNESS	VIS. POROSITY	POROSITY TYPE	FRAMEWORK	ACCESS	MATRIX (DETRITAL / CEMENT)	MTX TEXT.	% FRAMEWORK	SHOWS	CORES SWC's	INTERP. LOG	DST	SOURCE ROCK POT.	ENVIRONMENT INTERP	REMARKS	UNIT % FRAMEWORK	UNIT Snd-Sh	STRATIGRAPHY
0 50% 100		CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V. COARSE, V. COARSE +	VERY POOR, POOR, MOD. WELL, WELL, VERY WELL, MODE		V ANG., ANG., SUB ANG., SUB RND, ROUNDED, V ROUNDED	TIGHT, POOR, FAIR, GOOD, VERY GOOD	VUG, INT. GRAN, INTERPART, INT. XL, INT. SK	QUARTZ, ROCK FR, FELDSP, CARBONATE	PYRITE, MICA, GLAUC	CLAY, SILT, CARBONATE, CALCITE, SILICA	COMPACT, FRIABLE, SUCROSIC, REXL											SUB UNIT, UNIT, MEMBER, FORMATION, GROUP, AGE

REMARKS

- Post Mesozoic Cuk. sst
- AA
- AA
- AA
- Some grey silt
- Silty mudstone with asst. fraction as above
- AA - more sst, some med grained
- pebbly silty mudstone qtz granite + sand [illegible]
- AA
- sandy [illegible] siltstone
- silty mudstone with v.c.g. qtz grains
- AA
- dirty medium qtz sst
- AA - more silty less sandy
- AA more sst
- AA
- dirty silty sandstone - bimodal
- AA - coarser fraction (2-3mm)
- AA - less sst.
- AA
- AA
- calcareous [illegible] pebbles + shale + silt - mainly [illegible]
- on + on interbeds of shale, siltstone [illegible]
- [illegible] irregular straight [illegible]
- marine - alt. oxidising conditions, mica in small [illegible]
- highly calc. sandy mudstone
- muddy siltstone with calcareous pebbles [illegible]
- silty sandstone - qtz sand, carbonaceous [illegible]
- qtz sst? chert pebble
- qtz sst with mudstone - pyrite
- AA - chert pebbles
- [illegible] mainly a [illegible] type shale
- muddy silt with granules of qtz + carbonate
- silty mudstone with red qtzite pebble
- mudstone
- mottled silt mudstone with [illegible] qtz [illegible]
- AA - some [illegible] sst, more [illegible]
- AA
- AA - quite a lot of mica
- AA - [illegible] less mica highly calcareous [illegible]
- clear qtz sst some with dark [illegible]
- some [illegible] pebbles + siltstone [illegible]
- Some carbonaceous [illegible] pyrite?, [illegible] material
- Sandy siltstone - with red [illegible] pebble
- AA
- [illegible]
- siltstone with [illegible] pebbles shale [illegible]
- AAA - less shale, gypsum xtal
- AA - more shale, less sand
- As 630-640' - v. few shale pebble
- AA
- As 650-660'
- AAA - more qtz grains - coarse, rounded [illegible]
- AA
- AA - more sandy qtz grain.
- AA
- AA - few shale grains [illegible]
- AA - more shale + silt pebbles
- AA - much more mud
- AA - less mud
- AA
- AA - less pebbles
- AA
- AA
- AA - siltstone pebbles ferruginous [illegible]
- AA - pebbles of shale (red) + chert
- AA - pebbles of shale gypsum sparry [illegible]
- AA - more calc. pebbles, some Fe-staining
- AA - fine qtz calc. sst pebble
- AA more lst + shale pebbles (+ dolomite?)
- AA + some carbonaceous + [illegible]
- AA - more lst, very calcareous
- AA - some orange clay + green shale
- sst with large angular grains of [illegible]
- silty mudstone some sand, lst pebbles (AA) - much less [illegible]
- silty mudstone - lst pebbles (AA) (5%)
- AA - some small stained [illegible]
- AA - [illegible], Fe-staining
- AA - less lst, more Fe
- AA
- AA - [illegible] pebble

STRATIGRAPHY (top to bottom)

FORMATION	AGE
Eyre Fm	Tert.
Marree Fm	Cretaceous
Cadna-owie Fm	Cretaceous
	Tertiary
Marree + Cadna-owie Fm / Cadna-owie Marree ??	Cretaceous
Algebuckina Sst	Jurassic
Marree Fm	
Cadna-owie Fm	Cretaceous

JOB NO. 1444

MF 78

DEPARTMENT OF MINES AND ENERGY - SOUTH AUSTRALIA

CLASTIC LITHOFACIES DATA SHEET (A) DRILL CUTTINGS

WELL COMPANY / NAME / NO. Cootabarlow 2 KB GEl. LOGGER/DATE [illegible] DEPTH FROM TO

% Cuttings (0 50% 100)	COLOUR	GRAIN SIZE (CLAY, SILT, VERY FINE, FINE, MEDIUM, COARSE, V. COARSE, V. COARSE +)	SORTING (VERY POOR, POOR, MOD. WELL, WELL, VERY WELL, MODE)	DEPTH	ROUNDNESS (V ANG, ANG, SUB ANG, SUB RND, ROUNDED, V ROUNDED)	VIS. POROSITY (TIGHT, POOR, FAIR, GOOD, VERY GOOD)	POROSITY TYPE (VUG, INT. GRAN, INTERPART, INT. XL, INT. SK)	FRAMEWORK (QUARTZ, ROCK FR., FELDSP, CARBONATE)	ACCESS (PYRITE, MICA, GLAUC., Carb.)	MATRIX DETRITAL (CLAY, SILT)	MATRIX CEMENT (CALCITE, SILICA)	MTX. TEXT. (COMPACT, FRIABLE, SUCROSIC, REXL.)	% FRAMEWORK	SHOWS	CORES SWC's	INTERP LOG	DST	SOURCE ROCK POT.	ENVIRONMENT INTERP	REMARKS	UNIT % FRAMEWORK	UNIT Snd:Sh	SUB UNIT	UNIT	MEMBER	FORMATION	GROUP	AGE
				550'															Conglomerate, silty, [illegible]						[illegible]		T[illegible]
				600'															AA [illegible] rock fragments								
				650'															Pebbly silty sandstone [illegible]								
				700'															AA - less carbonaceous [illegible]								
				750'															Pebbly siltstone								
				800'															AA - less pebbles								
				850'															AA - pebbly [illegible]								
				900'															AA								
				950'															Silty [illegible] siltstone								
				1000'															AA [illegible]						Morree Fm.		Cretaceous
				1050'															AA								
				1100'															AA [illegible]								
				1150'															AA [illegible]								
				1200'															[illegible]								
				1250'															[illegible]								
				1300'															[illegible]						Cadna-owie Fm		
				1350'															[illegible]								
				1400'															AA [illegible]								
				1450'															[illegible]								
				1500'															AA [illegible]						Algebuckina Sst.		Jurassic
				1550'															AA								
				1600'															AA								

JOB NO. 1444