Natural Resources and Environment

AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT

Well Summary

Sherbrook-1

(W478)

1 Folio No	2 Referred to	3 Date	4 Clearing Officer's Initials	1 Folio No.	2 Referred to	3 Date	4 Clearing Officer's Initials
	Otway Onshore						
	PEP16						

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LOCATION

WELL SUMMARY
SHERBROOK-1
(478)

CONTENTS PAGE....

SECTIONS. . . . .

1.0 WCR

Plans to rear of the report.

41 Pages
+ 4 PLATES.

FROME-BROKEN HILL COMPANY PTY. LTD.

WELL COMPLETION REPORT - SHERBROOK NO. 1

SOUTHWEST VICTORIA

by

J. S. Bain

Melbourne

April, 1964

CONTENTS

ILLUSTRATIONS

Plates

Logs:

Electrical Log
Sonic Log
Microlog
Laterolog
Sonic-Gamma Ray Log
Continuous Dipmeter

: : : : : : : : :

I SUMMARY

The Sherbrook No. 1 well was drilled to a total depth of 5,434 feet within the southeastern part of the Otway Basin.

The well penetrated the Tertiary section, and equivalents of the marine Upper Cretaceous rocks noted in other wells, and bottomed in sediments of the Otway Group. The age of these Otway Group sediments is regarded as being Lower Cretaceous.

This well confirmed that the marine Cretaceous section pinches out eastward from the Port Campbell area, probably unconformably against the underlying Otway Group. The unconformity cannot be detected from lithological data in Sherbrook No. 1, although a seismic event interpreted to represent an unconformity exists within the Otway Group. It is possible that a section of the well immediately below the Waarre Formation and lithologically correlated with the Otway Group, and situated above the seismic event referred to above, may be reworked Otway Group sediments. It is also noticeable that the marine Cretaceous section here is more sandy than equivalents elsewhere and cannot be subdivided into the various unit described in other wells. Fossils were sparse in this interval which suggests that deposition of this unit was near the margin of the marine environment.

The Waarre Formation in this well contained fresh water, in contrast to salt water in previous wells, indicating that later flushing of this unit has taken place in this area.

Slight gas shows and some oil staining were noted in the marine Cretaceous interval and Otway Group respectively. The latter appeared to be confined to bedding and fracture planes within the Otway Group and neither zone yielded any hydrocarbons on test.

II INTRODUCTION

Sherbrook No. 1 was drilled by Frome-Broken Hill Company Pty. Ltd. to further evaluate the petroleum possibilities of the eastern part of the Otway Basin.

The well was located by seismic methods to test a section pinching out against a dominant subsurface reflector. This reflector was correlated to the top of the Otway Group and the section which pinched out was picked as being mainly the marine Cretaceous section noted in previous wells. The location was further sited near the axis of the recent Fergusons Hill structural uplift for lateral closure on the structure.

The Commonwealth Government agreed to share the cost of drilling Sherbrook No. 1 on a percentage basis of actual costs.

III WELL HISTORY

(1) General Data

(a) Well Name and Number:

Sherbrook No. 1.

(b) Location:

Parish of Latrobe, Shire of Otway, County of Heytesbury.
State Aerial Survey Vic. Princetown A Sheet, Ref. 019366.
Latitude: 38° 37' 33" south; longitude: 143° 07' 16" east.

(c) Name and Address of Tenement Holder:

Frome-Broken Hill Company Pty. Ltd.,
95 Collins Street,
MELBOURNE, C.1.

(d) Details of Petroleum Tenement:

Petroleum Exploration Permit No. 6, issued by the State of Victoria.

(e) District:

Southwest Victoria.

(f) Total Depth:

5,434 feet.

(g) Date Drilling Commenced:

November 19, 1963.

(h) Date Drilling Completed:

December 18, 1963.

(i) Date Well Abandoned:

December 19, 1963.

(j) Date Rig Released:

December 19, 1963.

(k) Drilling Time in Days to Total Depth:

30 days.

(l) Elevation:

Ground:	467 feet
Rotary Table:	480 feet

(m) Status:

Abandoned. Plugs set as follows:
Cement plug 3,615 to 3,800 feet with 116 sacks.
Cement plug 525 to 700 feet with 138 sacks.
Cement plug at surface with 10 sacks.

(n) Cost:

£72,380.

(2) Drilling Data

(a) Name and Address of Drilling Contractor:

Drilling Contractors (Australia) Pty. Ltd.,
383 George Street, Sydney, N.S.W.

(b) Drilling Plant:

Make:	National
Type:	Ideal 80-B
Rated Capacity with $4\frac{1}{2}$" drill pipe:	12,000 feet

Motors:

Make:	Waukesha
Type:	Model LRDBSU
B.H.P.:	526
Number:	3

(c) Mast/Derrick:

Make:	Lee C. Moore
Type:	136 feet
Rated Capacity:	700,000 lbs.

(d) Pumps:

Make:	Emsco	National
Type:	D850	G700
Size:	$8\frac{1}{4}$" x 18"	8" x 14"

(e) Blowout Preventor Equipment:

	(2)	(2)	(3)
Make:	Cameron	Hydril	Hydril
Type:	SS	GK	Accumulator
Size:	12"	12" flanged	
Series:	900	900	

(f) Hole Sizes and Depths:

(1) 20" conductor pipe set at 24 feet by hand.

(2) (i) Drilled $12\frac{1}{4}$" hole to 605 feet.
(ii) Reamed $12\frac{1}{4}$" hole to $17\frac{1}{2}$" hole to 605 feet.
(iii) Set $13\frac{3}{8}$" casing at 605 feet.

(3) (i) Drilled $8\frac{5}{8}$" hole to 5,434 feet T.D.

(g) Casing Details:

Size:	$13\frac{3}{8}$"
Weight:	48 lbs.
Grade:	H.40
Range:	2
Setting Depth:	605 feet

(h) Casing Cementing Details:

Size:	$13\frac{3}{8}$"
Setting Depth:	605 feet
Quantity Cement Used:	650 sacks
Cemented to:	Surface
Method Used:	Single stage cementing with plugs, by Halliburton cementing truck.

(i) Drilling Fluid:

Native mud was used to drill surface hole to 605 feet, the depth to which $13\frac{3}{8}$" casing was set.

After drilling out from the shoe the mud was converted to a Spersene-Bentonite-Caustic system and this was used to total depth.

A de-sander was used to advantage while drilling the sandy Wangerrip Group section, reducing sand content to a negligible figure.

Properties of the Spersene system to approximately 3,600 feet were as below:

Weight:	9.8 to 10.5 lbs/gal.
Viscosity:	35 to 70 sec.
Water Loss	15 to 32 cc.
Filter Cake:	2/32"
pH:	7 to 9.5
Sand Content:	$1\frac{1}{2}$% to 5%

Below this depth to T.D. the system had stabilised somewhat and average properties were as follows:

Weight:	10.2 to 10.6 lb/gal.
Viscosity:	42 to 60 sec.
Water Loss:	5.2 to 12.6 cc. and generally lower than 8 cc. below 5,000 ft.
Filter Cake:	2/32"
pH:	8.5 to 10
Sand Content:	1% or less.

(j) Water Supply:

Water was carted for the well (an unsuccessful water well having been drilled) from the nearby Sherbrook River and other water holes in the vicinity. Salinity of this water varied from 1,200 to 8,500 ppm. chlorides.

(k) Perforation and Shooting Record:

No perforating was carried out.

(l) Plugging Back and Squeeze Cementation Jobs: (See Plate No. 4)

(a) Spotted 116 sack plug from 3,600 to 3,800 feet.
(b) " 138 " " " 500 to 700 "
The above two plugs were tested and five feet of each drilled.
(c) Spotted 10 sack plug at surface.

(m) Fishing Operations:

No fishing operations were carried out in Sherbrook No. 1.

(n) Side-tracked Hole;

None.

3. Logging and Testing

(a) Ditch Cuttings:

Cuttings were taken over a normal shale shaker. Interval sampled was every 10 feet to 4,200 feet and thence every 5 feet to total depth, with bottom hole samples circulated at various depths.

Note: Samples were retained only for every ten feet, this being a representative cut of both the five feet sample intervals described.

(b) Coring: (See Appendix 4 for Core Description)

The original coring program outlined cores to be taken on the occurrence of hydrocarbons shows, indications of prospective reservoirs, at formation changes and drilling breaks, and at fossiliferous marker beds. In addition, Commonwealth Government subsidy agreement stipulated routine cores to be taken at 300 foot intervals, these intervals being extended to 500 feet for drilling within a section of uniform lithology.

Twenty-seven cores were cut for a total footage of 344 feet. Recovery was 210 feet 2 inches, or 61%.

All cores were cut with a Reed Kor-King barrel with soft and hard formation coreheads. Core diameters were $3\frac{1}{2}$".

(c) Sidewall Sampling: (See Appendix No. 4)

Sidewall cores were taken of various intervals using Schlumberger C.S.T. equipment. Thirty cores were attempted and twenty-one were recovered. Hard formation heads were found to be the most satisfactory.

(d) Electrical and Other Logging:

Logging was carried out by Schlumberger Seaco Inc., the engineer being J. A. W. White.

Logs were run as follows:

Electrical Log	Microlog	Sonic Log
33 to 587 feet	605 to 2585 feet	25 to 574 feet
604 to 2486 "	2385 to 3381 "	605 to 2579 "
2386 to 3381 "	3181 to 5413 "	
3181 to 5413 "		

Laterolog	Continuous Dipmeter	Sonic-Gamma Ray Log
2500 to 5410 feet	2500 to 5400 feet	605 to 5404 feet

Scales of all the logs run, except the Continuous Dipmeter, were 1" = 100 feet and 5" = 100 feet. The Continuous Dipmeter was recorded at 1" = 100 feet and 1" = 2 feet.

(e) Drilling Time and Gas Log:

A Geolograph continuous time-depth recorder was used during the drilling of Sherbrook No. 1, which recorded the time taken for each foot penetrated. A drilling time log was drawn up from the Geolograph records and is included in the Composite Log.

An Atlas continuous gas detector monitored the mud throughout the drilling and the gas log obtained from this instrument is included in the Composite Graphic Well Log.

(f) Formation Testing:

Testing was carried out by Halliburton Ltd. All the tests were carried out in open hole using a 5" Hydrospring tester and associated C.I.P. valves. Both No. 2 Wall Packer Assembly with $7\frac{3}{4}$" rubber and No. 3 Assembly with $7\frac{1}{2}$" rubber were used as packers, in a few cases run together to ensure a seat. In all, eleven tests were carried out on this well, details of which are as follows:

Note: The T and B in the pressure readings refer to top and bottom bombs respectively. Pressure readings are in psi.

D.S.T. No. 1 — 3,260 to 3,302 feet
Bottom choke $\frac{5}{8}$". Set packer at 3,260 feet. Initial flow period 2 minutes. Initial shut in 16 minutes. Final flow period 16 minutes. Final shut in period 30 minutes. Received weak blow which eventually died. Recovered 30 feet of drilling mud.

Hydrostatic -	Initial	T - 1740;	B - 1790.
	Final	T - 1740;	B - 1790.
Flow Period -	Initial	T - 360;	B - 380.
	Final	T - 20;	B - 60.
Shut In Period -	Initial	T - 360;	B - 380.
	Final	T - 90;	B - 110.

No bottom hole temperature taken.

D.S.T. No. 2 — 3,306 to 3,378 feet
Packer set at 3,306 feet. Mis-run. Tester did not appear to open.

D.S.T. No. 2a 3,306 to 3,378 feet
Packer set at 3,306 feet. Mis-run. Tester opened after long period and packer seat failed immediately.

D.S.T. No. 3 3,277 to 3,378 feet.
Packer set at 3,277 feet. Mis-run. Packer seat failed.

D.S.T. No. 4 3,248 to 3,378 feet
Packer set at 3,248 feet. Mis-run. Packer seat failed.

D.S.T. No. 5 3,342 to 3,378 feet
Bottom packer set at 3,342 feet. Bottom choke $\frac{5}{8}$". Flow period 2 minutes and 17 minutes. Shut in period 16 and 30 minutes. Received weak blow throughout flow period. Recovered 60 feet of drilling mud.

I.H.P. T: 1765; B: 1780 F.H.P. T: 1765; B: 1780
I.F.P. T: 20; B: 65 F.F.P. T: 45; B: 65
I.S.I.P. T: 1340; B: 1340 F.S.I.P. T: 1165; B: 1180
B.H.T. 122°F.

D.S.T. No. 6 3,763 to 3,800 feet
Bottom packer set at 3,763 feet. Bottom choke $\frac{5}{8}$". Flow periods 2 and 16 minutes. Shut in periods 14 and 10 minutes. Received very good blow of air throughout flow period. Recovered 2,036 feet of fresh water. Salinity 500 ppm. Cl. pH: 7.
Note: Thirty feet of loose sand on top of tool made flow pressures hard to read. N.R. indicates not read.

I.H.P. T: 2010; B: 2060 F.H.P. T: 2010; B: 2060
I.F.P. T: N.R.; B: 1260 F.F.P. T: N.R.; B: 1410
I.S.I.P. T: 1455; B: 1460 F.S.I.P. T: 1430; B: 1460
B.H.T. 149°F.

D.S.T. No. 7 4,854 to 4,896 feet
Packer set at 4,854 feet. Mis-run. Packer seat failed.

D.S.T. No. 8 4,864 to 4,896 feet
Bottom packer set at 4,864 feet. Bottom choke $\frac{5}{8}$". Flow periods 5 and 31 minutes. Shut in periods 30 and 23 minutes. Received weak blow of air decreasing to nil. Recovered 15 feet drilling mud.

I.H.P. T: 2630; B: 2650 F.H.P. T: 2630; B: 2650
I.F.P. T: 20; B: 55 F.F.P. T: 20; B: 55
I.S.I.P. T: 90; B: 110 F.S.I.P. T: 45; B: 80
B.H.T. 164°F.

D.S.T. No. 9 4,892 to 4,912 feet
Bottom packer set at 4,892 feet. Bottom choke $\frac{5}{8}$". Packer failed during first shut in period.

I.H.P. T: 2670; B: 2680 F.H.P. T: 2670; B: 2680
I.F.P. T: 135; B: 160

D.S.T. No. 10 4,900 to 4,931 feet
Bottom packer set at 4,900 feet. Bottom choke $\frac{5}{8}$". Flow periods 9 and 39 minutes. Shut in periods 30 and 15 minutes. Received fair blow which decreased to nothing. Recovered 15 feet drilling mud.

I.H.P. T: 2695; B: 2710 F.H.P. T: 2695; B: 2710
I.F.P. T: 20; B: 60 F.F.P. T: 20; B: 60
I.S.I.P. T: 90; B: 110 F.S.I.P. T: 45; B: 80
B.H.T. 162°F.

(g) Deviation Surveys:

Deviation surveys were carried out with the Totco instrument and in conjunction with the Schlumberger Continuous Dipmeter run. In general the deviation was between 1° and 3° to 3,000 feet, and from 3,000 feet to T.D. varied only between 2° and 4°. No difficulty was experienced in crooked hole.

(h) Other Well Surveys:

A well geophone velocity survey was run in conjunction with Ray Geophysics (Aust.) Pty. Ltd. to total depth in the well.

Check shots were taken at selected 500 and 1,000 feet intervals and compared to data already obtained from the Sonic Log.

IV GEOLOGY

1. Summary of Previous Work

(a) Geological:

Since the drilling of Flaxmans No. 1 late in 1961, field geological studies in the Port Campbell Embayment have been confined to a study of shot hole samples by Klaric (3) in the Princetown area. Klaric's surface maps and sections showed that the calcareous Heytesbury Group extended around the Fergusons Hill area where a structurally controlled inlier of sands and siltstones of the Wangerrip Group outcropped.

(b) Geophysical:

The Sherbrook No. 1 location was selected on the basis of results of a land seismic survey carried out by Ray Geophysics (Aust.) Pty. Ltd. and a marine seismic survey carried out by Western Geophysical Company of America.

Results of the seismic survey showed one dominant reflection, correlated to the top of the Otway Group, upon which the overlying section pinched out over some distance.

Sherbrook No. 1 was located to test the prospects of accumulation within this pinchout zone. Its location was also selected in relation to its position within a depositional re-entrant, thought to contain marine Cretaceous rocks, and near the axis of the recently uplifted Fergusons Hill structure. Furthermore, the site was picked in an area interpreted as being favourable for coarse sand development in this marine Cretaceous section.

(c) Drilling:

No wells had been drilled by this company in the Port Campbell Embayment since the Flaxmans No. 1 well, although the Victorian Mines Department continued its search for water in the vicinity.

During the course of drilling Sherbrook No. 1, the Mines Department were engaged in drilling a water well, Latrobe No. 1, near Princetown, and this well was completed at the same time as Sherbrook No. 1.

2. Summary of the Regional Geology

Surface geology in the Port Campbell Embayment does not provide much information about possible subsurface units and conditions. The surface is principally covered by Quaternary alluvium and extensive areas of Tertiary and Quaternary basalts and other volcanic rocks.

In the east the Otway Group sediments crop out extensively through the Otway Ranges and these sediments are unconformably overlain by Tertiary sediments along their western limit of outcrop. These Tertiary sediments are seen chiefly in the cliff sections extending between Princetown and Warrnambool.

The section encountered in previous wells in the Port Campbell Embayment is described briefly below from the lowermost beds, the Otway Group, up to the Heytesbury Group.

The Otway Group consists of sandstones of a subgreywacke type, siltstones and mudstones, with coal bands at intervals throughout the section. None of the previous wells in the Port Campbell Embayment has drilled through the Otway section, the maximum thickness penetrated being 3,840 feet in the Flaxmans No. 1 well. These Otway Group sediments are recognised on spore content to be of Lower Cretaceous age, at least to the depth drilled in Flaxmans No. 1, and it is thought that they underlie most of the younger Cretaceous and Tertiary sediments of the Otway Basin. The Otway Group sediments have been regarded as being of non-marine origin but whether this is so has not yet been proved conclusively and it is certainly possible that they may be marine in part.

Overlying the Otway Group in the Port Campbell Embayment is a section of sandstone, including some very clean sandstone, interbedded with minor siltstones, mudstones and coal bands. This section is the Waarre Formation which contains the gas reservoir tapped in the Port Campbell No. 1 well. This formation contains rare foraminifera and plant microfossils which are considered to represent alternating marine and freshwater conditions of deposition. The age of the Waarre Formation is generally regarded as Lower Cretaceous (Albian). Drilled thicknesses range from 202 to 454 feet. The Waarre unconformably underlies the Belfast Mudstone in places, but appears to be conformable with the overlying Flaxmans Beds where the latter have been penetrated.

The Flaxmans Beds are regarded as transitional between the Waarre Formation and the Belfast Mudstone, and in age appear to straddle the Lower to Upper Cretaceous boundary. These beds consist of brown to green sandy siltstones and chloritic greywackes, very limonitic in part. Drilled intervals range from 200 to 386 feet.

The Belfast Mudstone which consists of medium to dark grey, dense, glauconitic mudstone and siltstone is of marine origin and ranges in thickness from 378 to 2,100 feet in wells. This unit is fossiliferous and its age has been determined as early Upper Cretaceous. The Belfast Mudstone underlies the Paaratte Formation with apparent conformity.

The Paaratte Formation is regarded as representing a transition from the Belfast Mudstone to the arenaceous Wangerrip Group. It consists of fine to coarse grained quartz sandstone interbedded with grey to dark grey micaceous and carbonaceous siltstones and mudstones. Thicknesses cut in wells in the Port Campbell Embayment range from 317 to 810 feet and the age is regarded as Upper Cretaceous. This unit is predominantly of marine origin and conformably underlies the Wangerrip Group.

The Paaratte Formation, Belfast Mudstone, Flaxmans Beds and Waarre Formation are not known to crop out throughout the basin.

The Wangerrip Group comprises interbedded sand, sandstone, siltstone and mudstone, and coal bands. The sand units are the principal aquifers throughout the Otway Basin and thickness of this group ranges from 500 to 3,770 feet. The lower section contains Upper Cretaceous microfossils and the upper section is of Tertiary age. Rocks of this group crop out on the western flanks of the Otway Ranges.

Above the Wangerrip Group is the Heytesbury Group, a section of marl and limestone of Tertiary age, ranging in thickness from about 800 to 2,000 feet.

3. Stratigraphic Table - Sherbrook No. 1

Unit	Age	Subsurface Top (feet)	Thickness (feet)
Heytesbury Group	Miocene-Oligocene	Surface	495
Wangerrip Group	Eocene-Upper Cretaceous	508 (- 28)	2382
Paaratte-Belfast-Flaxmans Interval	Upper-?Lower Cretaceous	2890 (-2410)	886
Waarre Formation	Lower Cretaceous	3776 (-3296)	211
Otway Group	Lower Cretaceous	3987 (-2507)	1447

Note: Figures in brackets refer to depth below sea level of the various horizons.

The Paaratte Formation, Belfast Mudstone and Flaxmans Beds have not been differentiated in this well due to difficulties in correlating their specific lithologies from other wells, to specific intervals in Sherbrook No. 1.

4. Stratigraphy

General descriptions of the lithology cut in Sherbrook No. 1 are as follows:

Surface to 508 feet Heytesbury Group

Surface to 212 feet - Gellibrand Clay Marl; blue-grey to light green clay, fossiliferous.

212 to 255 feet - Clifton Formation Limestone; very light grey, limonitic, fossiliferous, glauconitic and slightly sandy in places.

255 to 508 feet
Marl; medium to dark grey and brown grey, fossiliferous, glauconitic.

508 to 2,890 " Wangerrip Group

Sand, sandstone, siltstone and coal bands. Dominantly medium to coarse grained, clean, loose sand, made up of clear quartz interbedded with medium to dark grey and brown grey, micaceous and carbonaceous siltstones and mudstones. Conglomerates up to pebble size made up of igneous and metamorphic fragments also present. Pyrite, coal and limonite are also present and dolomitic (?ankeritic) bands occur towards the base.

2,890 to 3,776 feet		Paaratte-Belfast-Flaxmans Interval
		Glauconitic and chloritic sandstone, siltstones, mudstones and clays. Mostly green to green-grey and dirty, with low porosity.
3,776 to 3,987	"	Waarre Formation
		Sand, sandstone with minor interbedded siltstone and mudstone. Sandstone is made up of clear and clean, medium to coarse grained quartz, with very little matrix, and is very porous.
3,987 to 5,434	"	Otway Group
		Sandstones, siltstones and mudstones. Light green-grey to medium grey, micaceous, very fine to medium grained, feldspathic, tight interbedded sandstones, calcareous in part, with light to medium to dark grey and green-grey, dense, carbonaceous siltstones and mudstones.

The section cut to 508 feet is equivalent to Baker's (2) Heytesbury Group, with the blue-grey, fossiliferous and, in parts, glauconitic marls dominant, and the Clifton Formation the light grey, limonitic and glauconitic sandy limestone present from 212 to 255 feet.

Below 508 feet the typical loose, clean quartz sandstones with minor interbedded medium dark grey siltstones and mudstones of the Wangerrip Group were intersected. Conglomerates up to pebble grade in grain size, and made up of varied igneous and metamorphic fragments, were cut from 1,760 feet, and continued to approximately 2,000 feet. These conglomerates are probably the equivalents of Baker's Pebble Point Formation which outcrops near Moonlight Head.

Below 2,000 feet the section remained dominantly clean and clear sand with interbedded medium to dark grey siltstones, coal bands, minor brown, dense, hard dolomite (?ankerite) bands. Fossils are sparse throughout this Wangerrip Group section but those recovered, although not diagnostic, are typical species of the Victorian Eocene and Palaeocene faunas.

Between 2,890 and 3,776 feet, sediments which are equivalent to the interval between the Wangerrip Group and the Waarre Formation were intersected. These rocks consisted of glauconitic and ?chloritic sandstones, siltstones, mudstones and clays, and in this well are barren of obvious macrofossils. Only one foraminifer, the Upper Cretaceous form Haplophragmoides, has been found in this interval. On lithological evidence, this section cannot be divided into the Paaratte Formation, Belfast Mudstone and Flaxmans Beds recognised in previous wells, but it is thought to represent a marginal marine environment equivalent, which probably accounts for the lack of marine fossils.

At 3,776 feet the typical dominantly clean, coarse quartz sandstones of the Waarre Formation were cut. Apart from minor siltstones in the Waarre Formation the whole interval to 3,987 feet is one of very porous sand development containing fresh formation water, as evident on the S.P. log and in drill stem test No. 6.

Below 3,987 feet the Otway Group of sediments was identified. These are made up of interbedded feldspathic sandstones siltstones and mudstones, and this section was drilled to T.D. of 5,434 feet. It is possible that to approximately 4,500 feet the upper Otway Group section may in fact be re-worked Otway sediments,as the base of the seismically mapped pinchout zone (probably true Otway Group) appears to be deeper than 3,987 feet.

5. Structure

As mentioned under Geophysics, the test was of a stratigraphic nature with the marine Cretaceous section assumed to be pinching out against a prominent reflector correlated to the top of the Otway Group. Dips of 10^{o} to 15^{o} were present in the cores. To determine exactly where the seismic reflection correlated to the top of the Otway and the base of the pinchout zone occurs in Sherbrook No. 1 is difficult. The Dipmeter survey shows consistent southwest dip from 4,800 feet down and this is obviously formation dip. It appears from the Dipmeter survey that the section from the base of the Waarre Formation to approximately 4,477 feet has reasonably consistent west-northwest dip, and it may be that this section, although similar to Otway in lithology, is re-worked Otway Group sediments,and that the seismic reflection at the base of the pinchout zone should be mapped at approximately 4,500 feet. It is noticeable on the sample and interpretive log that this section is composed mainly of a siltstone-mudstone facies and that below 4,500 feet the section contains sandstones.

6. Relevance to Occurrence of Petroleum

Indications of petroleum were seen in a number of places during the drilling of Sherbrook No. 1. The first was evident as gas recorded on the detector just below 3,300 feet and also some gas bubbles in Core No. 9 at 3,365 to 3,378 feet. Drill stem tests were carried out over this zone but no hydrocarbons were recovered and it was concluded that this zone was tight.

The Waarre Formation, which in previous wells has shown the presence of hydrocarbons, yielded fresh formation water on test, without evidence of hydrocarbons.

Within the Otway Group, Cores 20 to 23 (4,865 to 4,913 feet) evidenced oil staining and good hydrocarbon odour and fluorescence, as well as slight gas indications on the mud log. These oil shows were confined to bedding and fracture planes within these cores and were not disseminated through the pore space. Drill stem tests were carried out

over these intervals without any hydrocarbons being recovered, confirming that the sands were tight and that the shows were of a minor nature. Core analyses (see Appendix 4) showed that none of these cores exhibiting shows had any residual hydrocarbons but all had high water saturations.

7. Porosity and Permeability of Sediments Penetrated

Porosity and permeability were estimated qualitatively at the wellsite from cores and cuttings, and quantitatively from log and core analysis.

As is evident in Appendix 4, most of the sands analysed, although having some porosity, are generally of low or nil permeability and were determined as tight at wellsite. This is the case for sands in the Otway Group and also for sands in the Paaratte-Belfast-Flaxmans interval. The exception to this is Core No. 11 from 3,825 to 3,845 feet within the Waarre Formation. Very little of this core was recovered as the sand was loose and washed away on coring. It is obvious from the samples, logs and Drill Stem Test No. 6 that porosity and permeability within these sands is extremely high. Log interpretation shows porosities similar to those determined in the analysis.

The sands in the Wangerrip Group have the usual high porosities and permeabilities associated with them throughout the basin and continue to show their obvious potentials as freshwater aquifers.

8. Contribution to Geological Concepts Resulting from Drilling.

Sherbrook No. 1 added to our subsurface knowledge in the eastern part of the basin quite extensively.

Firstly it was confirmed that the marine Cretaceous section is much thinner here than where encountered in the wells further to the west on the Port Campbell structure. This fact, taken into account with the seismic sections and the surface outcrop unconformity of Tertiary over Otway Group, shows that this section is pinching out against these Otway Group sediments in an easterly direction.

The marine Cretaceous section (Paaratte-Belfast-Flaxmans interval) is of a much more sandy nature in Sherbrook No. 1 than equivalents in other wells, and is generally devoid of marine fossils. This further substantiates the fact that the Sherbrook location was close to the shoreline during deposition of this interval.

It is also possible, from evidence in this well, that the section from 3,987 to 4,477 feet, although correlated with the Otway Group, may in fact be re-worked Otway. Lithological and palynological studies on cores within this interval are awaited to better determine the nature of this interval. The Dipmeter survey and synthetic

seismogram run in Sherbrook No. 1 would seem to support the fact that the dominant reflecting horizon against which the pinchout occurs and which is correlated with the Otway Group, is at approximately 4,500 feet.

It was evident in Sherbrook No. 1 that the Waarre Formation, which in previous wells contained a salty formation water has, at some time, been flushed, and is now saturated with water similar to the fresh waters of the Wangerrip Group above.

Whether unconformities other than that occurring at the top of the Otway are present in this well is hard to determine. However, it would appear that an unconformity at the top of the Waarre Formation is likely on lithological evidence. Palynological studies may help to decide whether this is the case as marine fossils are extremely sparse in this section.

April, 1964 J. S. BAIN

REFERENCES

1. Bain, J. S. — Well Completion Report - Flaxmans No. 1, Southwest Victoria. Frome Report 7200-G-85, December, 1961.

2. Baker, G. — The Relationship of Cyclammina-bearing Sediments to the Older Tertiary Deposits Southeast of Princetown, Victoria. Mem. Nat. Mus. Melb. No. 18, May, 1953.

3. Klaric, R. — Contribution to Geology of Tertiary Deposits, Princetown Area. Frome Report 7200-G-92, October, 1963.

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1.1 Petrological Reports

APPENDIX 1

PETROLOGICAL REPORT

by

Australian Mineral Development Laboratories

Parkside, South Australia

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

Parkside, South Australia

SHERBROOK NO. 1

Core 10. 3,596 to 3,602 feet

This sample represents an unusual rock. The most prominent constituent occurs as numerous subrounded grains of deep-green, cryptocrystalline material akin to glauconite. An X-ray powder pattern of this material revealed kaolin, and glauconite or illite. Extensive further X-ray investigation would be required before the identity of this component could be definitely established.

Whilst the green grains could be glauconite as far as their appearance and structure is concerned, the context in which they are found is, to say the least, unusual if the concept of glauconite formation is to be accepted. It is generally held that glauconite forms under shallow-water conditions of very slow or negative sedimentation in a slightly reducing environment. However, the other constituents of this rock consist of angular to subangular grains of quartz, occasional cleavage-fragments of alkali-feldspar, and a silt-grade matrix of splinters of quartz and feldspar, flakes of mica (muscovite and biotite), abundant opaques ("limonite") and clays. In fact, the matrix gives the impression of being tuffaceous, though it is difficult to be certain about this without the examination of further material. The rock does not have the appearance of one formed under conditions suitable for glauconite-formation. The rock is poorly-sorted and sized; the larger detrital grains (? glauconite pellets and quartz) are from 0.13 mm to 0.50 mm in diameter, whereas the irregularly distributed matrix is of silt grade (0.0039 mm to 0.0625 mm).

March 25, 1964. H. W. FANDER

1.2 Palaeontological Reports

APPENDIX 2

PALAEONTOLOGICAL REPORTS

by

D. J. Taylor - Department of Mines of Victoria
J. Douglas - " " " " "

COMMENTS ON THE FAUNA IN SHERBROOK NO. 1 WELL

A detailed examination has been made on all cores, and rotary cuttings in the interval 200 feet to 4000 feet, from Frome-Broken Hill's Sherbrook No. 1 Well. In addition, 7 sidewall cores from the interval 1950 feet to 3750 feet were examined. The surface casing was run to 605 feet, thus sealing off the highly fossiliferous marls and silts which extend from the surface to 540 feet, so that rotary cutting contamination is at a minimum.

200-10 feet.

The good planktonic foraminiferal fauna, including Globigerina ciperoensis and G. woodi indicates that this interval represents the base of the Longfordian.

210-250 feet.

These light grey-brown sandy marls contain a sparse fauna which includes Globigerina ampliapertura euapertura, G. parva and Globorotalia opima opima. Dr. Wade (in Glaessner, 1959, p. 62) states that the latter species is restricted to the upper part of the Janjukian, Faunal Unit 5 of Carter's (1959) scheme.

250-350 feet.

The medium to dark grey marly clay is abundantly fossiliferous. This interval is marked by the first appearance of Globigerina ampliapertura ampliapertura, G. linaperta, "Guembelina rugosa", Bolivina anastomosa and B. pontis. Such a fauna is pre-Faunal Unit 5 and post-Faunal Unit 2. Current research by the author indicates that the above listed species have their highest stratigraphic appearance in Faunal Unit 4, although G. linaperta is represented by a morphotype which is more radially elongate than the morphotype illustrated by Carter (loc. cit.) from lower in the sequence. Below 300 feet, the earlier form of G. linaperta is present, which suggests that Faunal Unit 3 is also present within this interval, but a boundary cannot be designated in this section.

Thus the interval 250-350 feet represents the transition Upper Eocene to Oligocene.

350-530 feet.

Lithologically this interval is the same as the preceding one. It is differentiated by the first appearance of Globigerapsis index and G. tropicalis. The former species is characteristic of Carter's Faunal Units 1 and 2.

530-4000 feet.

Below 530 feet fauna is extremely rare, and definite intervals cannot be designated on palaeontological grounds, so the few samples containing foraminifera will be discussed individually.

Cores 1 and 2 (565-605 feet) contained Globigerapsis index which suggests an Upper Eocene age.

1290-1300 feet contained "Globigerina triloculinoides" and a form related to Astrononion centroplax.

1580-1590 feet contained Hanzawaia mariae.

1778-1785 feet contained Ceratobulimina westraliensis.

Side wall core at 2100 feet contained Anomalinoides sp. of lower Tertiary affinities and "Globigerina triloculinoides". The species from 1290 to 2100 feet are typical species of the Victorian Palaeocene, however they are not diagnostic species.

3100-3110 feet contained Haplophragmoides sp. A of the Victorian Upper Cretaceous sequence.

Apart from occasional contamination, no foraminifera were found below 3110 feet. A sample from core 20 (4865-67 feet) contained white, discoidal calcitic bodies of several millimetres in diameter, which were sometimes grouped in clusters with a resemblance to foraminifera. Thin sections and acid dissections revealed no internal structures, so that these bodies are not considered to be foraminifera.

Comments on the Stratigraphy

? to 210 feet - represents the equivalent of the Glenample Clay of the Pebble Point to Peterborough coastal section (refer Baker, 1953).

210 to 250 feet - represents both lithologically and palaeontologically the Clifton Formation of the coastal section.

250 to 530 feet - is lithologically similar to the Browns Creek Clays of Carter (1958). However, biostratigraphically this interval contains Carter's Faunal Units 1-4, whilst Carter (loc. cit.) assigns Faunal Units 1 and 2 to the Browns Creek Clays and Faunal Unit 3 to the Calder River Limestone and the Lower Glen Aire Clays. These formations occur in the Aire District, where two small Tertiary marine embayments are surrounded on three sides by the Mesozoic sediments of the Otway Group. Sediment, equivalent to the Browns Creek Clay is not present in the Pebble Point to Peterborough Coast section, as has been shown by recent drilling at Princetown, but is present in drilled sections further to the west.

It is noted that, in this section, the faunal sequence is uninterrupted between the Browns Creek Clays equivalent and the Clifton Formation.

Little stratigraphic comment can be made below 530 feet, except that the Tertiary marine sediments are present sporadically down to 2100 feet. The sample at 2100 feet is tentatively regarded as Palaeocene. Therefore the sediment between 530 feet down to at least 2100 feet is within the Wangerrip Group.

In the author's opinion, there is no sediment present which is typical of the Belfast Mudstone. Upper Cretaceous sediment is probably present; the lack of fauna being due to environmental conditions. These statements will be better explained in the report on Fergusons No. 1

D. J. TAYLOR
Geologist,
10.1.1964.

REFERENCES

Baker, G., 1953 The relationship of the Cyclammina bearing sediments to the older Tertiary deposits south-east of Princetown, Victoria. Proc.Roy.Soc.Vict., 60 (n.s.) p. 17-43.

Carter, A. N., 1958 Tertiary Foraminifera from the Aire District, Victoria. Geol.Surv.Vict., Bull. 55.

Glaessner, M. G., 1959 Tertiary stratigraphic correlation in the Indo-Pacific region and Australia. J. Geol.Soc. India, 1, p. 53-67.

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PRELIMINARY PALYNOLOGICAL EXAMINATION, SHERBROOK NO. 1 BORE

Bore core from the Sherbrook No. 1 bore was treated by the hydrofluoric acid - Schulzes solution method, and the acid insoluble residue examined for microfossils.

Results of examination are tabulated.

Core No.	Depth (feet)	Characteristic Microfossils	Sedimentation Environment
3	1305-29	Wetzeliella homomorpha	Marine
5	2280-93	Proteacidites, Nothofagus etc. sporomorphs. Much cellular debris.	Terrestrial
6	2902-21	Few microfossils isolated.	?Marine
8	3281-3501	Few microfossils isolated.	?Marine
9	3365-78	Odontochitina cribropoda.	Marine
10	3596-3602	Odontochitina cribropoda.	Marine
11	?	None isolated.	?
12	4042-49	(Upper Mesozoic micro-	?Marine
13	4049-64	(spores and unidentified (fragile dinoflagellate?	
14	4064-66	None isolated.	?Marine
17	4316-21	None isolated.	?Non Marine
18	4325-7	None isolated.	?Non Marine

Remarks:

Wetzeliella homomorpha, the characteristic form in Core 3 (1305-29 feet) was originally described from the Princetown member of the Dilwyn Clay regarded by Deflandre and Cookson (1955. Aust.Jour.Mar. & F.Wat.Res.), as Lower Eocene in age.

In core 9, the microplankton assemblage with O.cribropoda characteristic, indicates Upper Cretaceous sedimentation. The base of the Upper Cretaceous is more obscure, but pre Upper Cretaceous non marine sediments would appear to have been penetrated in Cores 18 (4325-7 feet), and 17 (4316-21 feet). Comparison of microfloras with those present in Fergusons Hill No. 1 well will be made on receipt of preparations.

J. DOUGLAS,
Geologist.

1.3 Water Analysis

APPENDIX 3

WATER ANALYSIS

by

State Laboratories, Melbourne

STATE LABORATORIES

MacArthur Street, Melbourne

JCK:SH
An. JA/FF/7/1

24th February, 1964

Report on Sample No. 1307/63
U.W.R.S. 3174

Sample : Water from Oil Bore
Locality : Parish of Latrobe
Sender : R. C. Glenie,
Mines Department.

Particulars:

No.	1307
U.W.R.S.	3174
Bore	Sherbrook No. 1
Sample	D.S.T. No. 6
Aquifer Level (feet)	3763-3800
Date	6.12.63
Owner	Frome-Broken Hill Co. Pty. Ltd.
Position	East side of Waarre Plantation, Brown's Hill.
Type of Test	Drill Stem

Results:		Parts per million	Me. per Litre
Total solids in solution (by hypothetical combination)		1733	
Chloride	(Cl)	263	7.42
Carbonate	(CO_3)	114	3.79
Bicarbonate	(HCO_3)	793	13.00
Sulphate	(SO_4)	3	0.06
Nitrate	(NO_3)	Nil	-
Fluoride	(F)	0.3	-
Sodium	(Na)	518	22.52
Potassium	(K)	18	0.46
Calcium	(Ca)	11	0.55
Magnesium	(Mg)	8	0.66
Iron-Total	(Fe)	123	-
Iron-Soluble	(Fe)	2.0	0.07
Silica-Soluble	(SiO_2)	3	-
Total Hardness (as $CaCo_3$)		59	
pH		9.4	

Note: The figure for total iron is the sum of the soluble and insoluble iron when the sample was analysed. It is likely that the total iron figure more truly represents the soluble iron content of the water in situ. However, in calculations of milliequivalents per litre, only the figure for soluble iron is used.

JOHN C. KENNEDY
Senior Chemist
Mines Department

1.4 Core Descriptions & Analysis

APPENDIX 4

CORE DESCRIPTIONS

by

Frome-Broken Hill Company Pty. Ltd.

CORE ANALYSIS

by

Bureau of Mineral Resources, Geology and Geophysics
Canberra

CORE DESCRIPTIONS

Core No. 1 — 565 to 585 feet. Recovered 20 feet.
Sandy SILTSTONE; brown-grey, medium to dark grey, micaceous, pyritic. Sand is white, very fine to coarse, subangular to well rounded, set in a medium to dark grey silty matrix with a few carbonaceous fragments. ?Fossiliferous. No evidence of oil or gas.

Core No. 2 — 585 to 605 feet. Recovered 8 feet.
Sandy SILTSTONE; medium to dark grey as for Core No. 1, apart from 6" of granule size sand in siltstone in middle of core. Granules are all white and milky quartz, and mostly well rounded, set in the silty matrix.

Core No. 3 — 1,309 to 1,329 feet. Recovered 20 feet.
Top 5 feet SILTSTONE; brown to brown-grey, soft, micaceous, glauconitic, pyritic, minor carbonaceous fragments.
1 foot 6" SILTSTONE as above but very pyritic and slightly sandy.
13 feet 6" Silty SANDSTONE to sandy SILTSTONE; brown, soft, glauconitic, pyritic, as for top 5 feet.
No oil or gas.

Core No. 4 — 1,778 to 1,785 feet. Recovered 4 feet.
PEBBLE CONGLOMERATE grading to SILTSTONE-MUDSTONE, medium to dark grey. Pebbles are rhyolite, porphyry, quartzite, reef quartz, sandstone, mostly angular although some rounded set in a silty matrix. Pyritised wood present. Core is tight and hard. No oil or gas. = Pebble Point Formation.

Core No. 5 — 2,280 to 2,293 feet. Recovered 1 foot.
SANDY SILTSTONE and MUDSTONE; brown grey to dark grey, with some loose conglomeratic pebbles of quartz and green chert. Core is slickensided.

Core No. 6 — 2,902 to 2,921 feet. Recovered 15 feet.
SANDSTONE; very fine to fine, light grey, tight. Interbedded with SILTSTONE, medium dark grey, micaceous, carbonaceous. Sandstone is made up of very fine to fine, subangular to sub-round, clean quartz, green, glauconitic, micaceous. Siltstone is micaceous, dense, carbonaceous and pyritic. Core is finely interbedded and laminated, with four inch section of pebble conglomerate in centre. Pebbles are round to well rounded quartz set in a medium dark grey silty matrix. Core is slightly cross bedded and shows evidence of micro-faulting. Apparent dip: 15° to 20°.
No oil or gas.

Core No. 7 — 3,046 to 3,066 feet. Recovered 14 feet.
SILTY SANDSTONE; grey to green-grey, made up of very fine to fine, mainly very fine, clear, white, angular to subangular fairly well sorted quartz set in a silty matrix. Glauconitic, micaceous, pyritic and with plant remains. Core is cross bedded with apparent dip of 5° to 8°. A few concretions of brown, hard dolomite (?ankerite) and pyrite and some coarse to very coarse quartz grains mainly towards bottom of core. Gas bubbles from the fresh core. No cut or fluorescence.

Core No. 8 — 3,281 to 3,301 feet. Recovered 10 feet.
SANDSTONE; dark green, glauconitic, made up of 80% glauconite, and very fine to fine with occasional coarse grained quartz set in glauconite (or chlorite?) matrix. Core is soft, friable, slickensided without evidence of oil or gas. Dolomitic concretions and dolomite filling fractures. Core appears to be fairly tight.

Core No. 9 — 3,365 to 3,378 feet. Recovered 13 feet.
SANDSTONE; very dark green, fine to coarse, subangular to round, poorly sorted quartz (approx. 60%), and 40% glauconite. Very dark green and black ?chloritic or glauconitic matrix. Core has porosity and is slickensided in places. Apparent dip: 10°. Dolomitic concretions and some carbonaceous matter. Gas bubbles evident from core.

Core No. 10 — 3,596 to 3,602 feet. Recovered 5 feet
SILTSTONE; glauconitic, sandy, made up of 50% silty chloritic?, dark grey matrix; 40% glauconite and/or chlorite and about 10% sand. Sand is clear (mainly) with few yellow (iron stained) fine to coarse, angular to subround. Glauconite associated with quartz. Core is tight and has some pyritic concretions. Slickensided. When hit splits at an angle of 25°.
No oil or gas. Density: 2.6.

Core No. 11 — 3,825 to 3,845 feet. Recovered 1 foot.
Top 2" SILTSTONE; dark grey-green, glauconitic, dense. Glauconite makes up 50% of rock. Glauconitic pellets.
Note: This may be caving from above.
10" SANDSTONE; light grey, made up of clear, milky, coarse to granule, angular to subrounded quartz with very little matrix. Sandstone has very high porosity.
No evidence of oil or gas. No cut.

Core No. 12 — 4,042 to 4,049 feet. Recovered 2 inches.
SILTSTONE; medium to dark grey, dense, micaceous, fairly hard.
No oil or gas.

Core No. 13 — 4,049 to 4,064 feet. Recovered 2 feet.
Top 8" SILTSTONE-MUDSTONE; medium grey, dense, tight, carbonaceous, pyritic with calcite concretions.
1' 4" SANDSTONE; light grey, fine to medium, angular to subrounded quartz, mainly with minor dark rock fragments (about 10% to 20%). Slickensided, tight, pyritic, few calcite concretions. Cross bedded.
No oil or gas. No cut.

Core No. 14 — 4,064 to 4,070 feet. Recovered 5 feet.
Top few pieces SANDSTONE; light grey, angular to subrounded, very fine to fine quartz mainly, with minor dark rock fragments in clay matrix, tight. No cut.
2' SILTSTONE; light grey to green-grey, blue-green, dense, micaceous, tight.
1' MUDSTONE; light to medium grey to green-grey, carbonaceous, tight.
2' SILTSTONE as for top two feet.
Density: 2.38. No evidence of oil or gas in core.

Core No. 15 4,189 to 4,191 feet. Recovery: Nil.

Core No. 16 4,191 to 4,200 feet. Recovery: Nil.

Core No. 17 4,316 to 4,321 feet. Recovered 2 feet.
SILTSTONE-MUDSTONE; medium to dark grey and blue-grey, dense, compact, tight, micaceous, very carbonaceous at bottom. No evidence of dip. No hydrocarbons.

Core No. 18 4,321 to 4,327 feet. Recovered 6 feet.
MUDSTONE; blue-grey, medium grey, grading into SILTSTONE in a few places. Dense, compact, fairly hard, tight. Slickensided with calcite on slickensided surface. Micaceous, carbonaceous, plant fragments. No evidence of oil or gas.
Apparent dip: 25° to 30°.

Core No. 19 4,598 to 4,610 feet. Recovered 3 feet.

Top 3"	MUDSTONE-SILTSTONE; light grey, dense, carbonaceous.
1' 3"	SANDSTONE; light grey to blue-grey, mottled with dark rock fragments, medium to coarse, angular to subrounded, dark rock fragments, feldspar, ?chlorite, micaceous and very minor quartz set in a soft, calcareous clay matrix. Tight, no cut or fluorescence.
4"	SANDSTONE; same as above but finer grain size.
11"	SANDSTONE; as for sandstone at top, medium to coarse grained.

Few gas bubbles in mud sheath but core generally tight, without fluorescence or cut.
Apparent dip: 5° to 15°.

Core No. 20 4,865 to 4,877 feet. Recovered 12 feet.
SANDSTONE; light grey to grey to green grey, fine to medium, angular to subround, dark rock fragments, feldspar, minor quartz, micaceous, carbonaceous, in white silty, clayey calcareous matrix. Slickensided and fractured in places.
Apparent dip: 25° to 45°.
Core has strong golden fluorescence along what appear to be fractures, and in some places bedding planes, in top foot and bottom foot. These parts are oil stained a yellowish brown colour and show good cut with solvent. Also good hydrocarbon odour in these parts. Soxhlet extraction yielded brown, oily residue with yellow fluorescence. However, the core is generally tight. Minor gas bubbles on mud sheath.

Core No. 21 4,879 to 4,889 feet. Recovered 5 feet.
SANDSTONE; light grey, mottled with dark rock fragments, fine to medium, angular to subround, feldspar, dark rock fragments and minor quartz in a soft, white to light grey, silty clay matrix. Calcareous in parts. Carbonaceous, tight.
Gas bubbles on mud sheath and strong oily odour throughout core. Staining, yellow brown in colour, and golden yellow fluorescence along bedding planes and fractured zones, are present. Apparent dip: 25°.

Core No. 22 4,889 to 4,896 feet. Recovered 7 feet.

5 feet SANDSTONE as for Core No. 21

2 feet SANDSTONE as for Core No. 21, but with abundant lenses and beds of black carbonaceous plant remains.

Some staining, odour and fluorescence as Core No. 21 except that in the bottom 2 foot interval fluorescence is scattered throughout. (Staining is not evident against the brown black carbonaceous matter.)

Soxhlet extraction yielded good brown, oily residue, with bright yellow fluorescence.

Core No. 23 4,896 to 4,913 feet. Recovered 8 feet.

3 feet SANDSTONE; light grey, fine to medium (few coarse), subangular to round and few angular, dark rock fragments (50%), feldspar (40%) and less than 10% quartz. Light grey to light green, silty-clay matrix, calcareous in parts, micaceous in parts (biotite) and ?chlorite probably in matrix. Trace of magnetite. Thin seams of coaly matter.
Density: 2.23. Apparent dip: 25°. Appears tight.

3 feet MUDSTONE-SHALE; medium grey, dense, tight, carbonaceous, plant fragments. Density: 2.3.

2 feet SANDSTONE as for top 3 feet except for higher content of mica and lower percentage of dark rock fragments, and generally tighter.

Strong yellow fluorescence along bedding planes and fractures in sandstone and mudstone, and yellow brown oily staining in these places. Good hydrocarbon odour throughout core.

Core 24 4,913 to 4,931 feet. Recovered 16 feet.

11' 6" MUDSTONE; medium to dark grey, dense, tight, indurated, fractured and slickensided, carbonaceous plant fragments. Density: 2.53.

1' 6" SILTSTONE-SANDSTONE; light grey, silty to very fine and few medium, angular to subround (mainly subangular), rock fragments, feldspar, quartz, minor chlorite and mica. Clayey matrix. Cross bedded, tight. Apparent dip: 23°. Density: 2.49.

3' MUDSTONE as for top of core.

No evidence of hydrocarbons throughout core.

Core No. 25 5,216 to 5,236 feet. Recovered 20 feet.

Top 4 feet SANDSTONE; medium grey to blue grey, very fine to medium, mainly fine to medium and fair sorting, tight, subangular to subrounded, dark rock fragments, feldspar, micaceous, carbonaceous fragments in noncalcareous matrix. Apparent dip: 25°.

16 feet SILTSTONE-MUDSTONE; medium to dark grey and some green and blue-grey, sub-conchoidal fracture in mudstone, dense, micaceous and very carbonaceous in spots.

No evidence of hydrocarbons throughout core.

Core No. 26 5,414 to 5,431 feet. Recovered 10 feet.
SANDSTONE; light grey, slightly green-grey, and brown-grey, made up of feldspar, quartz, dark rock fragments, very fine to medium, angular to subround, poor sorting, micaceous and ?chloritic. Very slightly calcareous matrix (?dolomitic), compact and tight. Slightly carbonaceous in parts.
Centre of core about 6 inches of intraformational pebble breccia-conglomerate with round and angular fragments, and of medium to dark grey and brown-grey MUDSTONE.
Apparent dip: 25°. No evidence of oil or gas.

Core No. 27 5,431 to 5,434 feet. Recovered 3 feet.
SANDSTONE as for Core No. 26. No hydrocarbons.

SIDEWALL CORES

1,950 feet	1½"	SANDSTONE; light grey, clear and clean quartz, fine to very coarse, angular to subrounded, poor sorting. Very porous. Water sand.
2,000	"	Lost in the hole.
2,042	"	Misfire.
2,100	"	1¾" SANDSTONE; light grey, clean and clear quartz, very fine to medium (mainly fine), very porous water sand with carbonaceous stringers.
2,150	"	1½" SANDSTONE as for 2,100 feet, but no carbonaceous matter.
2,300	"	Misfire.
2,400	"	1¼" SANDSTONE; light grey, clean and clear quartz, very fine to coarse, poor sorting, angular to subround, very porous water sand.
2,500	"	1" SANDSTONE; medium grey and brown-grey, dirty, very fine to very coarse, very poorly sorted, subangular to round, not very porous dirty water sand.
2,510	"	Misfire.
2,740	"	2" Half of core is SANDSTONE; light grey, very fine to medium, clean, angular to subround. Other half of core is SILTSTONE; medium to dark grey, dense, compact.
3,350	"	Lost in hole.
3,420	"	2" SANDSTONE; dirty green, fine to very coarse, subangular to subround, dirty quartz set in a dirty green, glauconitic matrix. Tight.
3,460	"	2" SANDSTONE; dirty green, fine to coarse dirty quartz, subangular to subround, set in a tight, dirty green, glauconitic and brown limonitic matrix.
3,560	"	1¾" SANDSTONE; brown and green-brown, dirty, fine to very coarse quartz set in green and brown glauconitic and limonitic matrix. Tight, dense.
3,750	"	2" SILTSTONE; green to medium green, dense, tight, soft, glauconitic with scattered quartz, fine to medium and carbonaceous matter in silty-clay matrix.
3,778	"	1½" SANDSTONE; very pyritic and carbonaceous, fine to coarse, poorly sorted, clean quartz sand. Waarre contact.
3,780	"	1" SANDSTONE; light grey, clean and clear, very fine to very coarse, poorly sorted, very porous, loose, angular to subround.

3,782 feet $1\frac{1}{2}$" SANDSTONE; light grey, very fine to coarse as for 3,780 feet, angular to subround, very porous.

3,784 " Recovery nil.

3,786 " $\frac{3}{4}$" SANDSTONE; light grey, very fine to very coarse, angular to subround, loose, very porous quartz.

3,980 " $\frac{1}{2}$" SANDSTONE as for 3,786 feet.

3,995 " $1\frac{3}{4}$" SANDSTONE; green-grey to light grey, made up of quartz, feldspar, dark rock fragments, micaceous, fine to medium and some few coarse. Fair sorting, slightly calcareous matrix, tight.

4,011 " Lost in hole.

4,030 " Lost in hole.

4,100 " $1\frac{1}{2}$" SANDSTONE; light grey, slightly mottled, very fine to medium (mainly fine), fair sorting, slightly calcareous, light grey silty matrix. Feldspar (some to clay), quartz and dark rock fragments.

4,400 " Lost in hole.

4,420 " $1\frac{3}{4}$" SANDSTONE; green-grey, dense, very fine to fine, same constituents as above. Tight, micaceous, dirty.

4,422 " $1\frac{3}{4}$" SILTSTONE to very fine SANDSTONE; green-grey, mottled, with dark rock fragments, feldspar and quartz. Tight, with patches of brown-grey, dense MUDSTONE.

4,424 " $1\frac{1}{2}$" SILTSTONE; medium grey, calcareous, dense, tight.

4,500 " $1\frac{1}{2}$" SANDSTONE; green-grey, feldspar, dark rock fragments, quartz, very fine to fine, fair sorting, micaceous.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra

Date: 19th February

CORE ANALYSIS RESULTS

Notes:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V & H) cut at right angles from the core or sample. Ruska porosimeter and permeameter were used, with air at 30 p s i.g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates and fluorescence of solvent after extraction are recorded as, nil, trace, fair, strong or very strong.

Well or Area	Core or Sample No.	Depth in ft. From:- To:	Lithology	Effective Porosity in % by Vol.		Absolute Permeability in Millidarcys		Avg density in gms /cc.		Fluid Saturation in % Pore Space		Acetone Test		Solvent after Extraction		Core Water Salinity Remarks	
																PPM	NaCl equivalent
				V	H	V	H	Dry Bulk	Grain	Water	Oil	Colour	Precipitate	Colour	Fluor	Using water %Extracted	Using 100% Water Sat.
Sherbrook No. 1	21_A 22^A	4879' 4896'	Sandstone	18	18	4	3	2.22	2.71	96	Nil	Nil	Nil	Nil	Trace	6,100	5,900
"	21_B 22^B	4879' 4896'	Sandstone	20	23	11	38	2.12	2.70	79	"	Trace	Nil	Trace	Fair	7,600	6,000
"	21_C 22^C	4879' 4896'	Sandstone with Carbonaceous mat.	19	19	4	3	2.25	2.78	80	"	Orange	Fair	Yellow	Strong	4,000	3,200
"	23	4896' 4898'	As above	21	22	6	3	2.22	2.83	71	"	Pale Yellow	Nil	Trace	Fair	6,100	4,300
"	23	4902' 4904'	Sandstone	13	14	Nil	Nil	2.40	2.78	79	"	Trace	Nil	Nil	Trace	9,400	7,400
"	25	5414' 5431'	Sandstone	15	18	Nil	Nil	2.30	2.76	71	"	Pale Yellow	Nil	Faint Trace	Fair	12,900	9,200
"	26	5414' 5431'	Sandstone with carbonaceous material.	15	13	Nil	3	2.48	2.77	87	"	Pale Yellow	Nil	Nil	Trace	9,900	8,600

Additional Information : 21/22A:- Vertical fractures showed stains fluorescing greenish yellow.
21/22B:- Bright orange & bright greenish-yellow fluorescence on mud-covered surfaces. Patches of bright greenish-yellow persist in inner part of core.

General File No. 62/399
Well File No. 63/1049

1.5 Velocity Survey

APPENDIX 5

VELOCITY SURVEY

by

Ray Geophysics (Aust.) Pty. Ltd.

TABLE OF CONTENTS

SUMMARY OF WELL VELOCITY SURVEY OF SHERBROOK NO. 1

The velocity survey of Sherbrook No. 1 was conducted along specifications and standards recommended by the Southern Well Shooting Association. This procedure is shown graphically by the layout diagram with this report.

Four holes were drilled at locations equidistant from the well and diametrically opposite each other at 500 ft. distance; single holes were also drilled on either side of the well at 1000 ft. distances. Charges of fifteen to sixty pounds were used for individual shots, the top of the charge being used for calculations.

A reflection spread was not observed across the location nor was an up-hole survey made since the well lies near the intersection of Lines 150 and 158 of the seismic survey of the Princetown Area. A velocity of 6000'/s was used for computing results to datum.

A total of thirteen shots were observed for the velocity survey at depths of 1000 ft., 2000 ft., 3000 ft., 4000 ft., and 5300 ft. These shots were taken as check shots for the sonic logs ran by Schlumberger which has been adjusted to the seismic records as shown by the comparison of data on the Calculation Form. The sonic log is in good agreement with the check shots except for the data at 1000 ft. in depth.

Plots of the Time vs Depth Curve, Average Velocity vs Depth Curve and Interval Velocity Curve are included. An average velocity function of 6200 + .46Z has resulted.

The well geophone was supplied by the Bureau of Mineral Resources.

Petroleum Technology Laboratory, Bureau of Mineral Resources, Geology and Geophysics, Canberra.

Date: 19th February, 1964

CORE ANALYSIS RESULTS

Notes:- (i) Unless otherwise stated, the porosities and permeabilities were determined on two small plugs (V & H) cut at right angles from the core or sample. Ruska porosimeter and permeameter were used, with air at 30 p s i g. and dry nitrogen, respectively, as the saturating and flowing media. (ii) Residual oil and water saturations were determined using Soxhlet type apparatus (iii) Acetone test precipitates and fluorescence of solvent after extraction are recorded as, nil, trace, fair, strong or very strong.

Well or Area	Core or Sample No.	Depth in ft From :- To:-	Lithology	Effective Porosity in % by Vol.		Absolute Permeability in Millidarcys		Avg density in gms /cc		Fluid Saturation in % Pore Space		Acetone Test		Solvent after Extraction		Core Water Salinity Remarks	
																PPM	NaCl equivalent
				V	H	V	H	Dry Bulk	Grain	Water	Oil	Colour	Precipitate	Colour	Fluor	Using water %Extracted	Using 100 Water Satur
Sherbrook No. 1	7	3046' 3066'	Sandstone and Carbonaceous Mat.	25	25	Nil	Nil	2.20	2.94	70	Nil	Pale yellow	Nil	Pale yellow	Fair	4,800	3,300
"	8	3281' 3301'	As Above	36	36	4	8	2.13	3.32	100	Nil	Nil	Nil	Nil	Trace	2,300	2,300
"	9	3366' 3367'	As Above	45*	28	25*	3	2.08	3.29	100	Nil	Nil	Nil	Nil	Faint Trace	2,100	2,100
"	9	3374' 3375'	As above with Mascroscopic pyrites	33	36	Nil	18	1.97	3.01	78	Nil	Nil	Nil	Nil	Faint Trace	3,500	2,800
"	9	3374' 3375'	As above	35	37	5	Nil	1.99	3.15	-	-	-	-	-	-	-	-
"	11	3825' 3845'	Friable Sandstone	22	20	N.D.	N.D.	2.04	2.58	89	Nil	Trace	Nil	Trace	Trace	10,000	8,900
"	19	4598' 4610'	Sandstone	24	18	5	3	2.25	2.85	64	Nil	Nil	Nil	Nil	Faint Trace	5,300	3,400
"	19	4598' 4610'	Sandstone	24	-	6	-	2.19	2.88	-	-	-	-	-	-	-	-
"	20	4866' 4867'	Sandstone	21	20	Nil	4	2.23	2.78	85	Nil	Nil	Nil	Nil	Trace	6,300	5,400
"	20	4866' 4867'	Sandstone	19	-	Nil	-	2.24	2.77	-	-	-	-	-	-	-	-

Additional Information: * This sample was obviously more porous than the "H" sample.

General File No. 62/396
Well File No. 63/1049

2.0 Well Card

WELL SHERBROOK No 1 W478 TYPE. N.F.W. BASIN W.D. 80

TEN. HOLDER Frome-Broken Hill Co. Pty. Lt'd lat. 38° 37' 33" S (Frome-B.H.J Ph. Latrobe

OPERATOR " " " LOCATION. Long. 143° 07' 16" E.

TENEMENT P.E.P. 6. Military Map. Princetown 1 mi. 019 366.

ELEVATION 467 G.L., 480 R.T. (Datum) T.D. 5434 Schl. 5431 Driller STATUS. D. & A.

SPUD. 19 November 1963 COMPL. 18 Dec. 1963 ABD. 19 Dec. 1963

CASING 13 3/8" @ 605' C. to S.

STRATIGRAPHY.

AGE	FORMATION	DEPTH.		E-Log.	THICKNESS.
	Heytesbury Group.	0	+480		
	Wangerrip. Group. (Pebble Point Fm.)	508 1770 - 2000	-28		2382
	Paaratte Fm. (Possibly incl. undiff. Belfast - Flaxmans equivalents)	2890	-2420	3000 (-2520)	886
	Wazrre Fm. Transition	3776	-3296	4000 (-3520)	211
	Otway Group.	3987.	-3507.	4050 (-3570)	1447+

FORMATION TESTS

D.S.T.	1.	3260 - 3302.	Rec. 30' drilling mud.
	2.	3306 - 3378.	Misrun Tester didn't open
	2a.	3306 - 3378.	Misrun Packer failed.
	3.	3277 - 3378.	Misrun Packer seat failed.
	4.	3248 - 3378.	" " " "
	5.	3342 - 3378.	Rec. 60' drilling mud.
	6.	3763 - 3800	Rec. 2036' water (Salinity 500ppm Cl.)
	7.	4854 - 4896.	~~Rec. 15' drilling mud~~. Misrun Packer failed.
	8.	4864 - 4896.	Rec. 15' drilling mud.
	9.	4892 - 4912	Misrun Packer failed.
	10.	4900 - 4931	Rec. 15' drilling mud.

LOG SUMMARY and INTERPRETATION

Type	Run	Interval	Date	Type	Run	Interval	Date	Interval	φ	Sw
E-Log.	1	587 - 33	20 Nov. '63	Sonic	1	574 - 25	20 Nov '63			
"	2	2486 - 604	24 " "	"	2	2579 - 605	24 " "			
"	3	3381 - 2386	29 " "	G.R+"	3	605 - 5404				
"	4	5413 - 3181								
				Dipmeter Log.		2500 - 5400				
Microlog	1	2585 - 605	24 Nov '63							
"	2	3381 - 2385	29 " "							
"	3	5413 - 3181		Laterolog	1	5410 - 2500				

Frome - Broken Hill Co. Pty Ltd

SHERBROOK No 1.

CORES

Nº	Interval	Rec	Nº	Interval	Rec	No	Interval	Rec	No	Interval	Rec.
1+2	565-605	28'0"	16	4191-4200	Nil	S.W.1	1950'	1½"	16	3778'	1½"
3	1309-1329	20'0"	17	4316-4321	2'0"	2	2000	lost hole	17	3780	1"
4	1778-1785	4'0"	18	4321-4327	6'0"	3	2042	Misfire	18	3782	1½"
5	2280-2293	1'0"	19	4598-4610 gas bubbles.	3'0"	4	2100	1¾"	19	3784	Nil
6	2902-2921	15'0"				5	2150	1½"	20	3786	¾"
7	3046-3066	14'0"	20	4865-4877	12'0"	6	2300	Misfire	21	3980	½"
8	3281-3301	10'0"	21	4879-4889	5'0"	7	2400	1¼"	22	3995	1¾"
9	3365-3378	13'0"	22	4889-4896	7'0"	8	2500	1"	23	4011	lost in hole.
10	3596-3602	5'0"	23	4896-4913	8'0"	9	2510	Misfire	24	4030	" " "
11	3835-3845	1'0"	24	4913-4931	16'0"	10	2740	2"	25	4100	1½"
12	4042-4049	0'2"	25	5216-5236	20'0"	11	3350	lost hole	26	4400	lost in hole
13	4049-4064	2'0"	26	5414-5431	10'0"	12	3420	2"	27	4420	1¾"
14	4064-4070	5'0"	27	5431-5434	3'0"	13	3460	2"	28	4422	1¾"
15	4181-4191	Nil				14	3560	1¾"	29	4424	1½"
						15	3750'	2"	30	4500	1½"

CHEMICAL ANALYSES (Oil, WATER, GAS.)

Water. D.S.T. No 6. 3763'—3800'

	P.P.m.
Total Solids in Soln	1733.
Chlorides.	263
Carbonate.	114
Bicarbonate	793
Sulphide	3
Nitrite	Nil
Fluoride.	0.3
Sodium	518
Potassium	18
Calcium	11
Magnesium	8
Iron - Total	123
Iron - Soluble	2.0
Silica - Soluble.	3.
Total Hardness (as $CaCO_3$)	59
PH	9.4

GENERAL (Conclusions. Structure, abandonment programme, etc)

Good oil staining. odour & cut from part of interval 4865-4913.
Staining was confined to fractures & bedding planes

Abandonment

plugs at 3685-3800. & 500-700. 525 Length plug at top of 13⅜" casing & steel plate welded over.

3.0 Weekly Drilling Reports

MINES DEPARTMENT
VICTORIA

(5)

PETROLEUM ACT 1958 (SECTION 45).

RECORD OF WORK AT .....SHERBROOK NO. 1..... bore on
*Petroleum Exploration Permit)
~~*Petroleum Prospecting Licence~~) Number ....6.....during week
~~*Petroleum Mineral Lease~~)
ending December 22..... 19.63....

* Strike out words not applicable.

DEPTH	DESCRIPTION OF STRATA
5337 to 5434 feet	Sandstone; very fine to medium grained, micaceous
	chloritic. Some intraformation sandstone breccia.
T.D	Dip 25°
	No shows of oil, gas or water.

NOTES BY DRILLER IN CHARGE: (State in notes whether water, gas or petroleum has been met with, and, if so, give depth and nature of occurrence, also depth to which casing has been inserted and cemented.)

Cores were cut of the intervals 5,414 to 5,431 feet and 5,431 to 5,434 feet. Logs were run as follows: Electrical Log 3,181 to 5,413 feet; Micro-Caliper 3,181 to 5,413 feet; Gamma Ray-Sonic 605 to 5,404 feet; Laterolog 2,500 to 5,410 feet, and Dipmeter 2,500 to 5,400 feet. Plugs were set at 3,600 to 3,800 and 500 to 700 feet and tested by drilling out top five feet. Cement was firm and good. A ten foot plug was placed in the top of the 13⅜" casing and a steel plate welded over. The well was abandoned December 19. This is the last progress report relating to this well.

PLUGS

Signed ...W. G. REED.....

Acting General ~~Legal~~ Manager, FROME-BROKEN HILL..... Co.

Date ..23.../..12./...63..

N.B. The Act also requires the Minister to be notified immediately water, gas or petroleum is encountered.

Analyses of water, gas and oil should be submitted if available.

1. Mr. Knight for
2. Mr. Keeley. (c/o for your files)

24.12.63

MINES DEPARTMENT
VICTORIA

(4)

PETROLEUM ACT 1958 (SECTION 45).

RECORD OF WORK AT ..... SHERBROOK NO. 1. ..... bore on

*Petroleum Exploration Permit)
~~*Petroleum Prospecting Licence~~) Number ....6.....during week
~~*Petroleum Mineral Lease~~)

ending December 15th.... 19.63....

* Strike out words not applicable.

DEPTH	DESCRIPTION OF STRATA
4830 to 4913 feet	Sandstone, very fine to medium grained, carbonaceous micaceous, white silty matrix in parts, calcareous in parts. Good oil staining, odour and cut from parts of interval 4865 to 4913 feet. Staining is confined to fracture and bedding planes.
4913 to 5337 feet	Interbedded siltstone-mudstone and sandstone, carbonaceous, micaceous, cross bedded in part.

NOTES BY DRILLER IN CHARGE: (State in notes whether water, gas or petroleum has been met with, and, if so, give depth and nature of occurrence, also depth to which casing has been inserted and cemented.)

Cores were cut of the intervals 4865 to 4877 feet, 4879 to 4889 feet, 4889 to 4896 feet, 4896 to 4913 feet, 4913 to 4931 feet and 5216 to 5236 feet. A drill stem test of the interval 4865 to 4896 feet recoverd 15 feet of mud, and a drill stem test of the interval 4900 to 4931 feet also yielded 15 feet of mud. No shows of gas or flows of water were noted during the week. Oil shows as above.

(Signed)..W..G..REED.....

Acting Gener~~al~~ Manager, ...FROME-BROKEN HILL... Co.

Date December/.20../..1963.

N.B. The Act also requires the Minister to be notified immediately water, gas or petroleum is encountered.

Analyses of water, gas and oil should be submitted if available.

1. [illegible]

2. [illegible] (c/y. for your file.) 23.12.63

MINES DEPARTMENT
VICTORIA

(3)

PETROLEUM ACT 1958 (SECTION 45).

RECORD OF WORK AT ....SHERBROOK NO. 1..... bore on
*Petroleum Exploration Permit)
*~~Petroleum Prospecting Licence~~) Number ....6.....during week
*Pe~~troleum Mineral Le~~ase)

ending .December..8..... 19..63....

* Strike out words not applicable.

DEPTH	DESCRIPTION OF STRATA
3825 to 3910 feet	Sand, sandstone; clean, coarse grained, minor glauconite, siltstone.
3910 to 4598 feet	Interbedded siltstone-mudstone and sandstone; carbonaceous, micaceous, pyritic, glauconitic in parts. Sand grains quartz, feldspar and dark rock.
4598 to 4830	Interbedded sandstone, siltstone, mudstone, generally as above, but tending to darker colour with increase in proportion of dark rock fragments and reduction in proportion of quartz.

NOTES BY DRILLER IN CHARGE: (State in notes whether water, gas or petroleum has been met with, and, if so, give depth and nature of occurrence, also depth to which casing has been inserted and cemented.)

Cores were cut of the intervals 3825 to 3845 feet, 4042 to 4049 feet, 4049 to 4064 feet, 4064 to 4070 feet, 4189 to 4191 feet, 4191 to 4200 feet, 4316 to 4321 feet, 4321 to 4327 feet and 4598 to 4610 feet.

In the core cut from 4598 to 4610 feet a few gas bubbles were noted in the mud sheath.

No shows of water or oil were noted during drilling.

(Signed) .....

Acting General ~~Legal~~-Manager, FROME-BROKEN HILL Co.

Date ...13.../...12.../63.....

N.B. The Act also requires the Minister to be notified immediately water, gas or petroleum is encountered.

Analyses of water, gas and oil should be submitted if available.

1. Mr Knight - for
2. Mr Henley (C/- for Mines File)

16.12.63

MINES DEPARTMENT
VICTORIA

(2)

PETROLEUM ACT 1958 (SECTION 45).

RECORD OF WORK AT .....SHERBROOK NO. 1..... bore on
*Petroleum Exploration Permit)
*~~Petroleum Prospecting Licence~~) Number ...6.....during week
*~~Petroleum Mineral Lease~~)
ending December 1..... 19.63....

* Strike out words not applicable.

DEPTH	DESCRIPTION OF STRATA
2902 to 3278 feet	Interbedded sand, sandstone, siltstone, micaceous, carbonaceous, becoming glauconitic towards the base.
3278 to 3378 feet	Dark green, glauconitic, chloritic sandstone some sand.
3378 to 3780 feet	Siltstone - mudstone, glauconitic, sandy in parts
3780 to 3825 feet	Sand, loose, very clean, medium to pebble grain size, trace coal and pyrite.

NOTES BY DRILLER IN CHARGE: (State in notes whether water, gas or petroleum has been met with, and, if so, give depth and nature of occurrence, also depth to which casing has been inserted and cemented.)

Cores were cut of the intervals 2902 to 2921 feet, 3046 to 3066 feet, 3281 to 3301 feet, 3365, to 3378 feet and 3596 to 3602 feet.

Drill stem tests were made as follows: DST 1 3260 to 3302 feet - recovered 30 feet drilling mud. DST 2 3306 to 3378 feet misrun. DST 2a 3306 to 3378 misrun. DST 3 3277 to 3378 feet misrun. DST 4 3248 to 3378 feet misrun. DST 5 3342 to 3378 feet - recovered 60 feet drilling mud. The electric log was run from 2386 to 3381 feet and microlog and caliper from 2385 to 3381 ft.

Signed .....
Acting General
~~Legal~~ Manager, ...(W.G. Reed)..... Co.

Date ..9..../..12../..63...

N.B. The Act also requires the Minister to be notified immediately water, gas or petroleum is encountered.

Analyses of water, gas and oil should be submitted if available.

1. Mr Knight, to note. [illegible]
2. Mr Hanley, P/g - [illegible] 11.12.63.

(1)

MINES DEPARTMENT
VICTORIA

PETROLEUM ACT 1958 (SECTION 45).

RECORD OF WORK AT .....SHERBROOK NO. 1..... bore on
*Petroleum Exploration Permit)
~~*Petroleum Prospecting Licence~~) Number ...6.....during week
~~*Petroleum Mineral Lease~~)
ending .November. 24th.. 19.63.... Elevation 467 G.L. 480 K.T. (Datum)
* Strike out words not applicable.

DEPTH	DESCRIPTION OF STRATA
Surface to 230 feet	Marl, light grey to green, fossiliferous
230 to 270 feet	Limestone, sandy, light grey.
270 to 540 feet	Marl, grey, fossiliferous, glauconitic in part.
540 to 1760 feet	Sand, sandy siltstone, siltstone.
1760 to 2000 feet	Pebble conglomerate and siltstone. Pebbles of rhyolite, porphyry, reef quartz, sandstone.
2000 to 2,900 feet	Sand, sandy siltstone, few thin coal bands.
2,900 to 2,902 feet	Interbedded very fine slightly glauconitic sandstone and calcareous siltstone.

NOTES BY DRILLER IN CHARGE: (State in notes whether water, gas or petroleum has been met with, and, if so, give depth and nature of occurrence, also depth to which casing has been inserted and cemented.)

Cores were cut of the intervals 565 to 605 feet.

1309 to 1329 feet, 1778 to 1785 feet and 2280 to 2293 feet.

No shows of oil, gas or water were noted.

13⅜" casing was run to 605 feet and cemented to surface.

Logs were run to 2585 feet.

Signed ..W. G. Reed.....

Legal Manager, Frome-Broken Hill..... Co. Pty. Ltd.

Date .November 28th. 1963..

N.B. The Act also requires the Minister to be notified immediately water, gas or petroleum is encountered.

Analyses of water, gas and oil should be submitted if available.

1. Mr Knight.
2. Mr Hanley, Oy. for your files

29.11.63

29-11-63.

ENCLOSURES . . . . . .

PE903998

This is an enclosure indicator page.
The enclosure PE903998 is enclosed within the container PE907565 at this location in this document.

The enclosure PE903998 has the following characteristics:

ITEM_BARCODE	= PE903998
CONTAINER_BARCODE	= PE907565
NAME	= Composite Well Log
BASIN	= OTWAY
PERMIT	= PEP 6
TYPE	= WELL
SUBTYPE	= COMPOSITE_LOG
DESCRIPTION	= Composite Well Log (enclosure from Well Summary) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 19/12/63
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= Sherbrook-1
CONTRACTOR	=
CLIENT_OP_CO	= Frome Broken Hill Co Pty Ltd

(Inserted by DNRE - Vic Govt Mines Dept)

PE907559

This is an enclosure indicator page.
The enclosure PE907559 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907559 has the following characteristics:

ITEM_BARCODE	= PE907559
CONTAINER_BARCODE	= PE907565
NAME	= Stratigraphic Column Prior to Drilling
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= WELL
SUBTYPE	= STRAT_COLUMN
DESCRIPTION	= Stratigraphic Column Prior to Drilling (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 30/04/64
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE903997

This is an enclosure indicator page.
The enclosure PE903997 is enclosed within the container PE907565 at this location in this document.

The enclosure PE903997 has the following characteristics:

ITEM_BARCODE	= PE903997
CONTAINER_BARCODE	= PE907565
NAME	= Geological Cross Sections
BASIN	= OTWAY
PERMIT	= PEP 6
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Geological Cross Sections before & after drilling (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 30/04/64
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= Sherbrook-1
CONTRACTOR	=
CLIENT_OP_CO	= Frome Broken Hill Co P/L

(Inserted by DNRE - Vic Govt Mines Dept)

PE907558

This is an enclosure indicator page.
The enclosure PE907558 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907558 has the following characteristics:

ITEM_BARCODE	= PE907558
CONTAINER_BARCODE	= PE907565
NAME	= Geological and Locality Map
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= WELL
SUBTYPE	= MAP
DESCRIPTION	= Geological and Locality Map (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 30/04/64
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE907560

This is an enclosure indicator page.
The enclosure PE907560 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907560 has the following characteristics:

ITEM_BARCODE	= PE907560
CONTAINER_BARCODE	= PE907565
NAME	= Geological Map
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= WELL
SUBTYPE	= GEOL_MAP
DESCRIPTION	= Geological Map, Port Campbell Embayment, Application for Subsidy (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 30/09/63
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE907562

This is an enclosure indicator page.
The enclosure PE907562 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907562 has the following characteristics:

ITEM_BARCODE	= PE907562
CONTAINER_BARCODE	= PE907565
NAME	= Geological Section
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= WELL
SUBTYPE	= CROSS_SECTION
DESCRIPTION	= Geological Section Across Proposed Site of Sherbrook-1 (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 31/10/63
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE907561

This is an enclosure indicator page.
The enclosure PE907561 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907561 has the following characteristics:

ITEM_BARCODE	= PE907561
CONTAINER_BARCODE	= PE907565
NAME	= Seismic Section
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= SEISMIC
SUBTYPE	= SECTION
DESCRIPTION	= Variable Seismic Section Across Pinchout Zone, Line 158 (enclosure from WCR) for Sherbrook-1
REMARKS	= With coloured horizon interpretation
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE907563

This is an enclosure indicator page.
The enclosure PE907563 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907563 has the following characteristics:

ITEM_BARCODE	= PE907563
CONTAINER_BARCODE	= PE907565
NAME	= Isochron Map
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= SEISMIC
SUBTYPE	= ISOCHRON_MAP
DESCRIPTION	= Seismic Survey Princetown Area Isochron Map, Marine Cretaceous Interval (Top of Paaratte to Top of Otway) Superimposed on top of Time Contours (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	= 30/09/63
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

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PE907564

This is an enclosure indicator page.
The enclosure PE907564 is enclosed within the container PE907565 at this location in this document.

The enclosure PE907564 has the following characteristics:

ITEM_BARCODE	= PE907564
CONTAINER_BARCODE	= PE907565
NAME	= Species Distribution List
BASIN	= OTWAY
PERMIT	= PEP/6
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Species Distribution List, Microfloral Zonation, (enclosure from WCR) for Sherbrook-1
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W478
WELL_NAME	= SHERBROOK-1
CONTRACTOR	=
CLIENT_OP_CO	= FROME-BROKEN HILL CO PTY LTD

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