

INTERSTATE OIL LIMITED

WELL COMPLETION REPORT

DARLINGTON No. 1

W 594A

WCR for.....

DARLINGTON-1

PURA PURA-1

CARRANBALLAC-1

INTERSTATE OIL LIMITED

FINAL REPORT

L.E.P. 76

VICTORIA

3 SCOUT DRILL HOLES:-

DARLINGTON - 1 W594A

PURA PURA - 1 W596A

CARRANBALLAC - 1 W597A

Melbourne
October, 1970.

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*See Orway Basin files
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P.E.P. 76, VICTORIA - FINAL REPORT

INTRODUCTION

Petroleum Exploration Permit No. 76 comprising some 1,310 square miles in the Darlington - Skipton area of Western Victoria was granted to Interstate Oil Limited for a period of two years as from 1st February, 1970.

The permit area is situated on the northern margin of the Otway Basin, a sedimentary accumulation of Mesozoic and Tertiary age considered prospective for petroleum occurrence.

A reconnaissance gravity survey carried out by Frome-Broken Hill Company during 1963 covered portion of P.E.P. 76 and preliminary interpretation of this data indicated an anomalous gravity minimum situated in the central portion of the permit area. A possible explanation of this gravity minimum was the presence of an isolated sedimentary trough or embayment since gravity minima in the Port Campbell and Tyrendarra areas to the south were known to correspond to areas of thicker sedimentary section.

Non prospective pre-Mesozoic rocks outcrop on the northern, eastern and western margins of P.E.P. 76 but the central portion of the permit is covered by recent basalts. Shallow basement was known to be present beneath basalt cover near Derrinallum but no information was readily available from water bores drilled in the area of the main gravity minimum to indicate the nature of the sub-basalt lithology.

An early Geological Survey Report (Murray, 1883) recorded the presence of coal seams within steep dipping sediments below thin basalt cover near Skipton at the northern end of the gravity minimum and this gave support to the proposal that a sedimentary trough may exist in the permit area.

EXPLORATION ACTIVITIES

1. Geological:

The general surface geology of the area has been mapped by officers of the Victorian Mines Department and is incorporated in the preliminary edition of the 1:250,000 Ballarat Sheet.

A review of available literature relating to the geology of the area was undertaken and field reconnaissance carried out including an unsuccessful attempt to relocate the site of shafts near Skipton in which Murray had reported coal seams.

During the geological evaluation it was observed that the area of the gravity minimum occupies a topographic low relative to surrounding areas and is roughly flanked by a series of volcanic eruption centres and scoria cones. It was considered that these surface indications could be related to the presence of a small graben in the area of main interest.

A detailed study of available boring records was carried out and revealed that none of the Mines Department or private water bores within the zone of the gravity minimum had penetrated through the base of the surface basalts.

2. Geophysical:

No geophysical surveys were undertaken.

A review of the earlier Frome-Broken Hill reconnaissance gravity survey was made and this information was integrated with results from a detailed gravity survey carried out by Shell/Frome late in 1969 in the area immediately to the south of the southern boundary of the permit.

This review confirmed that a significant gravity minimum existed in the central portion of PEP 76 with the minimum axis trending north-easterly from a position some 6 miles west of Darlington on the southern margin to a position some 2 miles north of Skipton in the north-easterly quadrant.

The recent Shell/Frome survey suggested a possible connection from the Darlington area to the Port Campbell Embayment via a weak gravity trough with axis situated about 2 miles west of Mortlake.

It was recognised that the intensity of the gravity low in the Darlington - Skipton area is repeated elsewhere in the Otway Basin in only two areas viz. the Torquay Sub-basin and the Port Phillip Embayment.

3. Drilling:

Three scout drill holes were drilled to investigate the cause of the gravity minimum.

Darlington No. 1, Pura Pura No. 1 and Carranballac No. 1 were drilled to depths of 359 feet, 345 feet and 495 feet respectively.

For convenience of access the wells were sited adjacent to the shire road from Darlington to Carranballac which transects the gravity minimum obliquely. They were located 2.5 miles north of Darlington, 2.5 miles north of Pura Pura and 4 miles south-southwest of Carranballac respectively. The two former wells were sited on the eastern side of the road reserve and the latter on private property adjacent to the eastern side of the road reserve.

A fourth hole had originally been proposed situated midway between Darlington and Pura Pura but this was not proceeded with due to considerable drilling difficulties encountered in drilling, the other holes and the geological information already obtained from these earlier holes.

Detailed results of the information obtained in the drilling of the three scout holes are attached hereto as appendices. A complete set of cuttings samples which were collected at 10 foot intervals will be lodged with the Mines Department Core and Cuttings Laboratory.

4. Summary of Stratigraphic Data obtained from Drilling:

The Pleistocene to Recent basalts and/or Volcanics thicken northwards from 125 feet at Darlington No. 1 to about 260 feet at Pura Pura No. 1 and Carranballac No. 1.

Below the basalt each of the three holes encountered a section of predominantly quartzose clastics which was 173 feet thick in Darlington No. 1 and 152 feet thick in Carranballac No. 1.

In Darlington No. 1 this elastic sequence is marginal marine in character and in part the fine quartz grains are cemented by calcite forming friable sandstone which exhibits finescale cross-bedding. Macro fossils recovered in the lower portion of the sequence suggest a lower to middle Miocene age (personal communication, T. Darragh - Nat. Museum). Microfossils include foraminifera suggesting Lower Miocene (lower Longfordian) and Pliocene (Whaler's Bluff) age (C. Abele - V.M.D.).

In Pura Pura No. 1 and Carranballac No. 1 the quartzose clastics are non marine in character being noticeably lignitic in Carranballac No. 1 from which well a microfloral assemblage indicates a Lower Miocene to Oligocene age (J. Douglas - V.M.D.). Below the Tertiary quartzose clastics in Darlington No. 1 approximately 50 feet thickness of granitic wash and weathered granite was penetrated and finally fresh, hard, biotite granite was encountered at 350 feet hole depth.

In Carranballac No. 1 a section of 85 feet thickness of felspathic quartz grit was penetrated to total depth. This grit is very angular with some composite quartz-felspar grains and traces of mica suggesting derivation from a nearby granitic source. It shows remarkable similarity to present day surface granitic wash and weathered granite overlying granite outcrop in the Flagstaff Hill area immediately to the east of Skipton. It is considered that granite basement would occur at little below total depth in the Carranballac No. 1 well.

CONCLUSIONS AND RECOMMENDATIONS

The stratigraphic information obtained from the three scout drill holes reveals that a narrow, shallow trough of Tertiary quartzose clastic sediments extends northwards into P.E.P. 76 from the Darlington area toward Skipton beneath surface basalt cover. These Tertiary sediments are somewhat thicker than would be predicted from the known subsurface geology of the adjoining Derrinallum - Lismore area but are of insufficient thickness to adequately account for the gravity minimum anomaly.

The well information suggests that the Upper Tertiary marine shoreline was situated close to the Darlington No. 1 well and probably considerably south of Pura Pura No. 1.

It appears most unlikely that any lower Tertiary or Mesozoic sediments extend northward into the limits of P.E.P. 76.

The gravity minimum may be produced by a combination of the following factors:

- (1) variation in thickness and/or density of surface basalts and volcanics, (minor effect only),
- (2) variation in thickness of pre-basalt sediments (probably minor effect only)
- (3) variation in basement lithology.

It is possible that the pre-basalt sediments thicken slightly in a position about 3 miles northwest of Darlington No. 1 but it can be confidently assumed that the thickness and/or areal extent of sediments is insufficient to justify additional petroleum effort - in the area of P.E.P. 76.

It is recommended that P.E.P. 76 be relinquished.

R.B. LESLIE

WCR

Darlington-1

(W594A)

INTERSTATE OIL LIMITED

WELL COMPLETION REPORT

DARLINGTON No. 1

W594A

Darlington - 1

GENERAL DATA

Well name and number : Darlington No. 1

Name and address of Operator : Interstate Oil Ltd.
95 Collins Street
Melbourne. Vic. 3000.

Tenement Holder : Interstate Oil Ltd.

Petroleum Tenement : PEP 76

District : Ballarat (1:250,000, SJ 54-8)

Parish : Jellalabad

Location : Approx. co-ordinates, 37° 57' 40" S.
143° 03' 18" E.
(See locality plan attached)

Elevation : Not determined - approx. 550'

Total Depth : 359'

Date drilling commenced : 17th June, 1970

Date total depth reached : 26th June, 1970

Date rig released : 28th June, 1970

Status : Abandoned

Drilling Contractor : W.L. Sides & Sons Pty. Ltd.

Drilling Plant : "Schramm" Model T64 H-B

Drilling Fluid : Compressed air

Total Cost : Approx. \$3,150

L. 5659

TO GEELENG

JELLALABAD

COUNTY OF
HAMPDEN

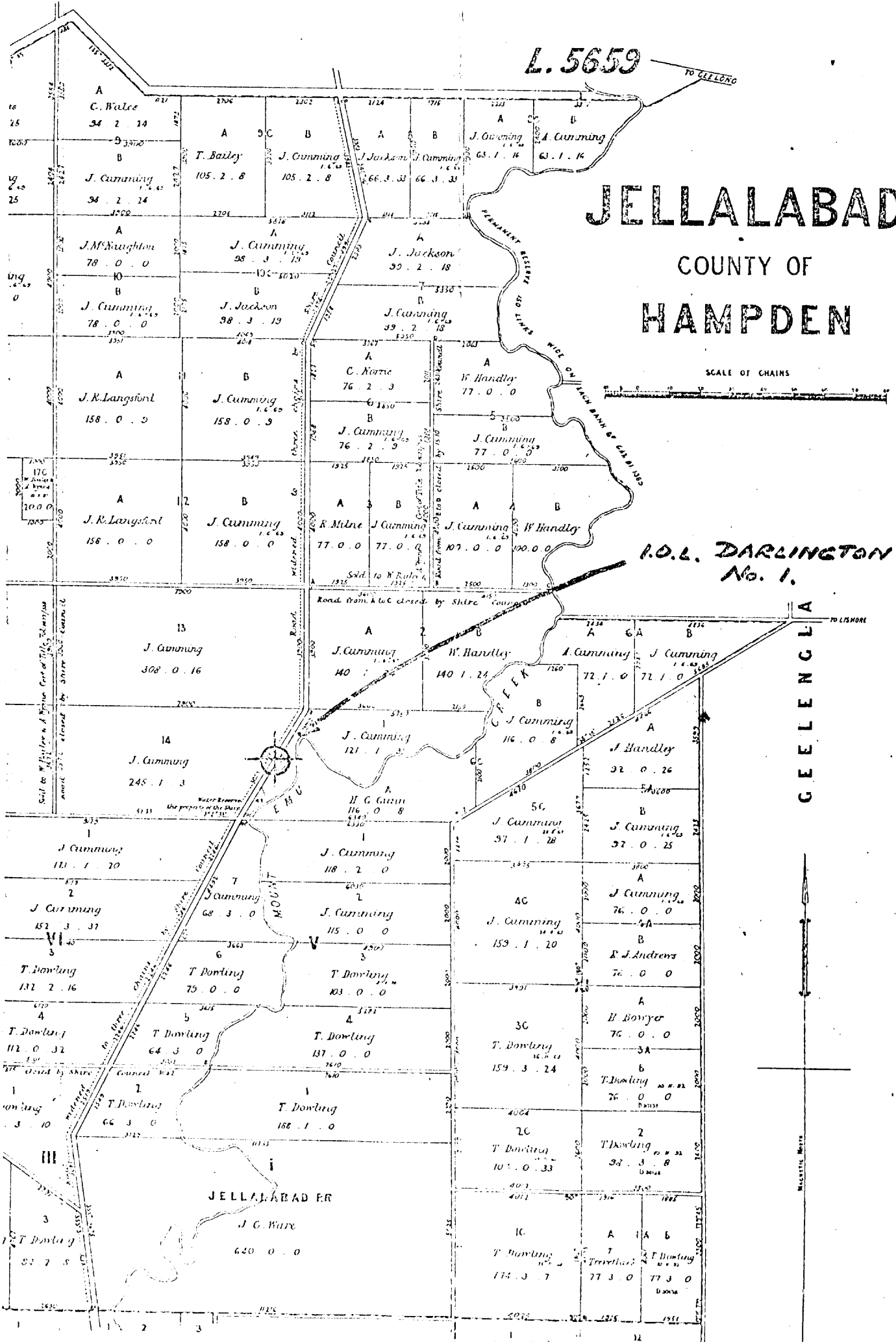
SCALE OF CHAINS

I.O.L. DARLINGTON
No. 1.

GEELENGLA

TO LISMORE

MAGNETIC MERIDIAN



INTERSTATE OIL LIMITED

Phillips log — Darlington #1

0 - 20'	Basalt
20' - 40'	mainly clay
40' - 60'	Weathered basalt (water at 60')
60' - 96'	Basalt hard, with few soft-ban
96' - 100'	Sandy gritty clay
100' - 102'6"	Basalt
102'6" - 110'	Green grey & buff gritty clay.
110' - 125'	Basalt
125' - 130'	Yellow brown gravel & sand
130' - 160'	Mainly fine sand
160' - 170'	Some lumps of sandstone
170' - 224'	Mainly fine sand with some green grey clay
224' - 225'	hard band ? ironstone
225' - 230'	? brown clay
230' - 298'	mainly fine sand. hard band at 298'
300' - 332'	Sand with shell fossils
332' - 334'	hard band
334' - 340'	Sand.
340' - 350'	hard formation
350' - 359'	very hard formation

INTERSTATE OIL LIMITED

Cuttings Description — Darlington #1

- Footage
- 0-10 Basalt, medium light grey, finely xtalline,
reticulate intergrowths with vesicular cavities
- 10-20 Basalt light to medium grey, finely xtalline,
vesicular, weathering to light brown & tan.
- 20-30 Basalt, medium light grey but mostly
weathering to tan and rusty brown.
trace pale red brown clay
- 30-40 Basalt, as above
- 40-50 Basalt, medium light grey weathering to
tan, rust brown and mauve, rounded
vesicles with infillings calcite and zeolite
minor light brown clay
- 50-60 Basalt, medium light grey, mostly
weathering to pale yellow brown.

(water ingress at approximately 60' depth).
- 60-70 Basalt, dark grey, hard, dense
also weathered basalt as above
minor pale red brown to light brown gritty clay
trace limonitic material
- 70-80 Basalt, dark grey, hard, dense.
- 80-90 Basalt, medium dark grey weathering to
red brown.
Abundant calcite colorless to pale lemon
infilling vesicles and as veins
minor red brown gritty clay

90-100

Basalt, medium dark grey weathering to greyish brown, some calcite veins.
Clay, red brown, gritty.

100-110

Basalt, medium dark grey, weathering to grey brown, some calcite veins.
Clay, red brown, pale grey to green and mauve, gritty with some coarse granules quartz.

110-120

Clay, pale green grey, grey-white and buff, very gritty with some coarse granules quartz.
Basalt medium dark grey weathering to red brown. Some calcite veining.

120-130

Basalt light grey to medium dark grey weathering to yellow brown, vesicular in part.

Clay mainly buff, very gritty.

Sand, fine to medium grained, angular to well rounded, predominantly clear quartz with yellow brown surface staining.

(Drilling broke at 125' depth and water ingress increased to approx 1000 g.p.h.)

130-140

80% Sand, unconsolidated, yellow brown, fine to medium grained, angular to well rounded, mainly clear quartz with fe. staining to well polished, minor chert & polished limonite grains.

trace limonite & fossil fragments.

10% Clay, pale grey white, soft.

10% Basaltavings.

140-150

Sand unconsolidated, yellow brown, very fine to medium grained, angular to well rounded, mainly well polished some Fe. staining.

Consists 80% quartz colorless, white, yellow brown, pink, mauve.

20% chert, lithics and limonite
strong trace clay, grey white, soft.

trace fossil fragments.

150-160

as above

160-170

50% loose sand as above.

30% sandstone, pale buff, very fine grained with "salt & pepper" texture, predominantly quartz with dark, heavy mineral bands, calcite cement.
trace fossil fragments

10% Sandstone, tan to dark brown, fine to medium grained quartz & lithics with limonitic clay cement

10% Clay, pale grey green, med light grey and mauve, soft.

trace dolomitic limestone, white

trace fossil fragments

170-180

as above

180-190

50% loose sand as above

10% Sandstone pale buff, as above

10% Sandstone, tan to dark brown, as above

20% Clay grey green to pale grey

10% ? Dolomite, white

trace fossil fragments

- 190-200
 60% loose Sand as above
 5% pale buff sandstone, a.a.
 5% tan to dk. brown sandstone a.a.
 30% Clay grey green to pale grey, a.a.
 trace ? dolomite white
 trace fossil frags.
- 200-210
 60% loose Sand a.a.
 40% Clay grey green to pale grey, lt brown
 5% tan to dk brown sandstone a.a.
 5% ? dolomite white a.a.
 strong trace fossil fragments
- 210-220
 As. above.
- 220-230
 60% loose Sand as above
 40% Clay greenish grey, med grey,
 mauve.
 trace sandstone pale buff & tan
 trace ? dolomite white
 trace fossil fragments.
- 230-240
 as above
- 240-250
 as above
- 250-260
 as above
- 260-270
 as above
- 270-280
 80% loose Sand a.a.
 10% Clay a.a.
 10% fossil fragments
 trace ? dolomite white a.a.

Darlington 1

280-290

as above

290-300

as above

300-310

as above plus some pale grey to pinkish grey feldspar and rare flakes black biotite mica.

(water ingress increased to 1500 g.p.h.)

293-304

Special circulation sample obtained during casing operations.

Granitic gravel dirty grey brown, poorly sorted, very fine grained to granule and pebbles of 10 m.m. Subangular to well rounded, mainly quartz clear, grey, yellow, some inclusions of biotite and feldspar intergrowths, subordinate feldspar pinkish grey, grey, brown, occasional intergrowths with quartz. Abundant fossils include trilobites, gastropods, corals to 4 cm across. Some pyrite or marcasite encrusting fossils. Rare fragments limonite coquina and calcareous, limonitic sandstone. (Water ingress increased to 3000 g.p.h. during circulation and was later cut off by advancing casing to 304 feet depth.)

310-320

70% Granite wash dirty grey brown, fine to medium grained and granules with occasional pebble size. Predominant quartz angular to subrounded, clear, white, grey, occasional inclusions biotite and pyrite, subordinate feldspar pale grey to pinkish grey, subrounded to rounded, traces of flakes and small 'books' biotite mica

25% Clay, greenish grey and buff, silty.

5% Fossil debris (? cavings)

trace limestone grey white-brown, fossiliferous, trace sandstone dirty limonitic also some fresh pyrite cementing quartz grains.

320-330

as above

330-340

as above

340-350

as above

350-359

50% Granite wash as above

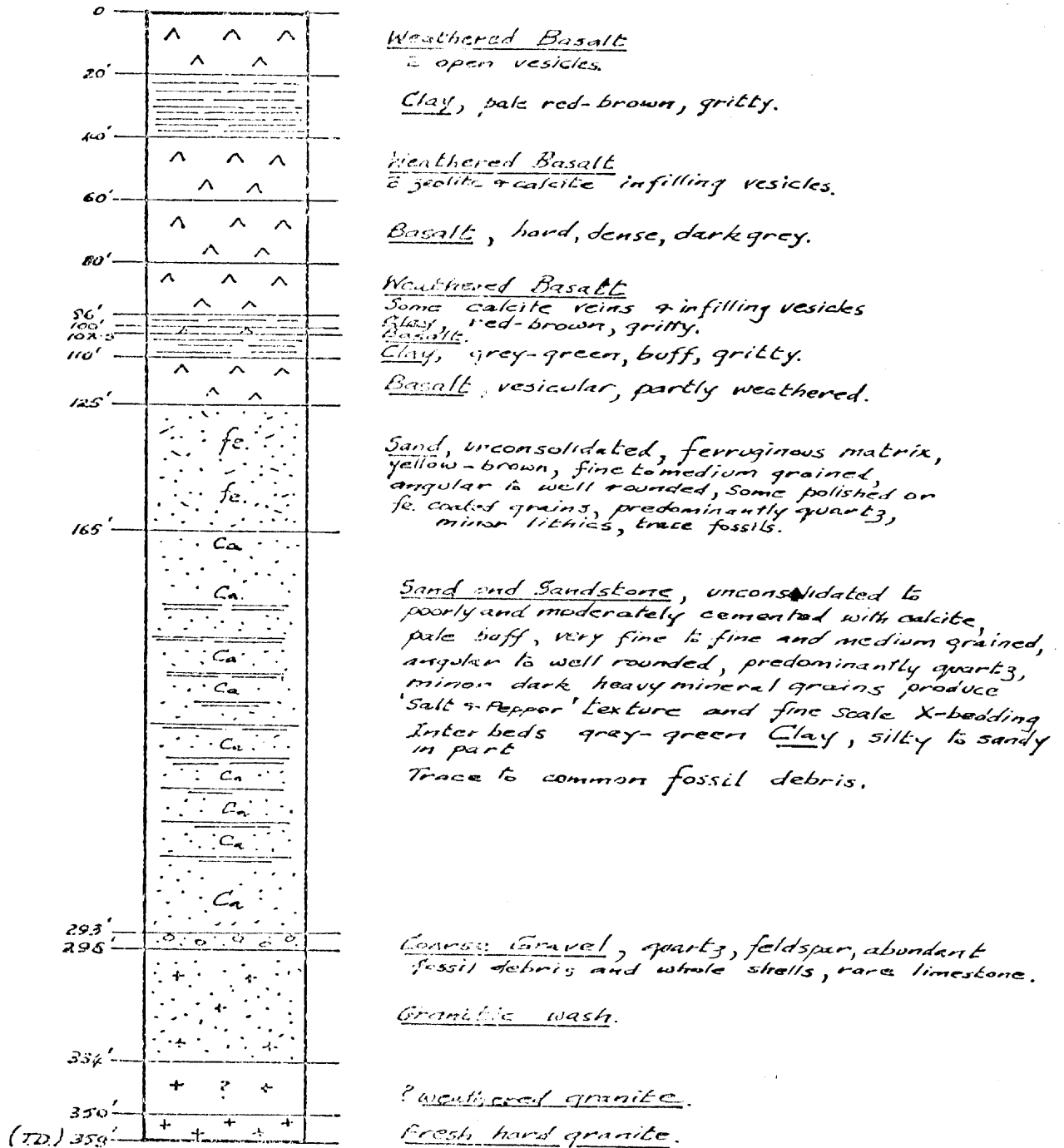
50% Biotite Granite fresh, composite and individual grains consisting quartz clear to pale grey, feldspar colorless to pale grey, white and pinkish brown, biotite black

359'

(circulation sample)

100% fresh granite as above

I.O.L. DARLINGTON - 1



Scale. 1 inch = 50 feet.

Darlington 1

Micropaleontological Report on
Darlington 1 well
(2 1/2 miles north of Darlington, southwestern Victoria).

Samples from the Interstate Oil Ltd. Darlington 1 well were submitted by Mr. R.B. Leslie for micropaleontological investigation. The following samples were examined micropaleontologically in October, 1970:

Depth: 140' - 150'
 190' - 200'
 290' - 300'
 300' - 310'
 310' - 320'
 320' - 330'
 330' - 340'

The foraminiferal assemblages present are generally poor and badly contaminated; hence only a few comments of biostratigraphic interest can be made.

Calcarina mackeyi was recorded from the samples between 290' and 340'. According to Carter (1958, and other papers) this species is limited to his "Faunal Units" 5 and 6; thus the oldest marine strata in the Darlington 1 Well sequence appear to be late Janjukian to early Longfordian (probably the latter, equivalent to Lower Miocene, rather than the former, since Victoriella conoides was not observed) in age.

Very rare specimens of Globigerinoides trilobus were observed in the 290'-300' and 330'-340' samples; these are regarded as contaminants from overlying beds. Similarly, Rotalia beccarii (= Ammonia soteana, according to Nicholls, 1968) was recorded from the 300-310' and 320'-330' samples. This species appears to be restricted to post-Miocene strata in Victoria (Nicholls, 1968); however, the level at which such Pliocene beds, probably equivalent to the Moorabool Visduct Sand in the Geelong district, occur in the Darlington 1 Well sequence cannot be reliably estimated on the basis of available evidence.

27th October, 1970.

Dr. C. ABELE
 Senior Geologist.
 O.I.C. Palaeontology Section.

REFERENCES

- CARTER, A.N., 1958. Tertiary Foraminifera from the Aire District, Victoria. Geol. Surv. Vict. Bull. 55.
 NICHOLLS, D.R., 1968. Studies in Victorian Foraminifera above the Orbulina universon Datum. M.Sc. thesis, University of Melbourne (unpubl.).

ADDRESS ALL COMMUNICATIONS
CHIEF CHEMIST
TELEPHONE 63 0921



Darlington 1

MINES DEPARTMENT
CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

GMC:MS

An. PM, FF, 3/7

28th August, 1970

Report on Sample No. 1063/70

U.W.R.S.7513

Sample : Bore Water
Locality : Parish Jellalabad
Sender : Mr. Leslie,
Interstate Oil Limited,
95 Collins Street,
MELBOURNE.
I.O.L. Darlington No.1

Particulars:

Bore	
Plant	-
Sample	-
Date	19.6.70
Depth (feet)	-
Aquifer level (feet)	125-340
Static level (feet)	-
Drawdown (feet)	-
Aquifer type	Sandstone
Yield (gph)	-
Test type	-
Bore cased to (feet)	-
Position	2-5 miles north of Darlington
Owner	Interstate Oil Limited
Address	95 Collins Street.
Remarks	-
Label No.	-

Results:

Parts per million

Total solids in solution	6698
Chloride (Cl)	2780
Carbonate (CO ₃)	Nil
Bicarbonate (HCO ₃)	1296
Sulphate (SO ₄)	325
Nitrate (NO ₃)	Nil
Calcium (Ca)	128
Magnesium (Mg)	450
Sodium (Na)	1456
Potassium (K)	29
Iron-Total (Fe)	0.3
Iron-Soluble (Fe)	0.10
Silicate (SiO ₃)	40.0

Total hardness (as CaCO₃) 2586

pH	7.4
Electrical Conductivity at 25°C.	10812 micromhos/cm.
Specific Resistance at 20.5°C.	102 ohmcm.

Darlington 1

Comment:

Magnesium and calcium salts are precipating from this water.

W. Kennedy
Chief Chemist

ADDRESS ALL COMMUNICATIONS
CHIEF CHEMIST
TELEPHONE: 630321
GMG:MS

An. HM, 31/7



Darlington 1

MINES DEPARTMENT
CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

29th September, 1970

Report on Sample No. 1229/70

U.W.R.S. 7595

Sample : Bore Water
Locality : Parish Jellalabad
Sender : Interstate Oil Ltd.,
95 Collins Street,
MELBOURNE.

Particulars:

Bore	-
Plant	-
Sample	-
Date	25.6.70
Depth (feet)	-
Aquifer level (feet)	293-304
Static level (feet)	Flowing
Drawdown (feet)	-
Aquifer type	Gravel
Yield (gph)	5000
Test type	-
Bore cased to (feet)	293
Position	2.5 miles north of Darlington
Owner	Interstate Oil, Ltd.
Address	95 Collins St. Melb.
Remarks	-
Label No.	-

Results:

Parts per million

Total solids in solution	5553
Chloride (Cl)	2670
Carbonate (CO ₃)	Nil
Bicarbonate (HCO ₃)	1801
Sulphate (SO ₄)	355
Nitrate (NO ₃)	Nil
Calcium (Ca)	408
Magnesium (Mg)	-
Sodium (Na)	-
Potassium (K)	-
Iron-Total (Fe)	0.4
Iron-Soluble (Fe)	0.1
Silicate (SiO ₂)	46
Total hardness (as CaCO ₃)	-

pH	7.1
Electrical Conductivity at 25°C.	9096 micromhos/cm.
Specific Resistance at 21°C.	124 ohmcm.

Chief Chemist

WCR

Pura Pura - 1

(W596A)

APPENDIX II

PURA PURA-1

Pura Pura-1
WCR

INTERSTATE OIL LIMITED

WELL COMPLETION REPORT

PURA PURA No. 1

W 596 A

GENERAL DATA

Well name and number : Pura Pura No. 1

Name and address of Operator : Interstate Oil Ltd.
95 Collins Street
Melbourne. Vic. 3000

Tenement Holder : Interstate Oil Ltd.

Petroleum Tenement : PER 76

District : Ballarat (1:250,000, SJ 54-8)

Parish : Kornong

Location : Approx. co-ordinates, 37°47'06" S.
143°06'03" E.
(See locality plan attached)

Elevation : Not determined - approx. 750'

Total depth : 345'

Date drilling commenced : 28th June, 1970

Date total depth reached : 1st July, 1970

Date rig released : 2nd July, 1970

Status : Abandoned

Drilling Contractor : W.L. Sides & Sons Pty. Ltd.

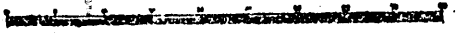
Drilling Plant : "Schramm" Model T64 H-B

Drilling fluid : Compressed air

Total cost : Approx. \$1,350

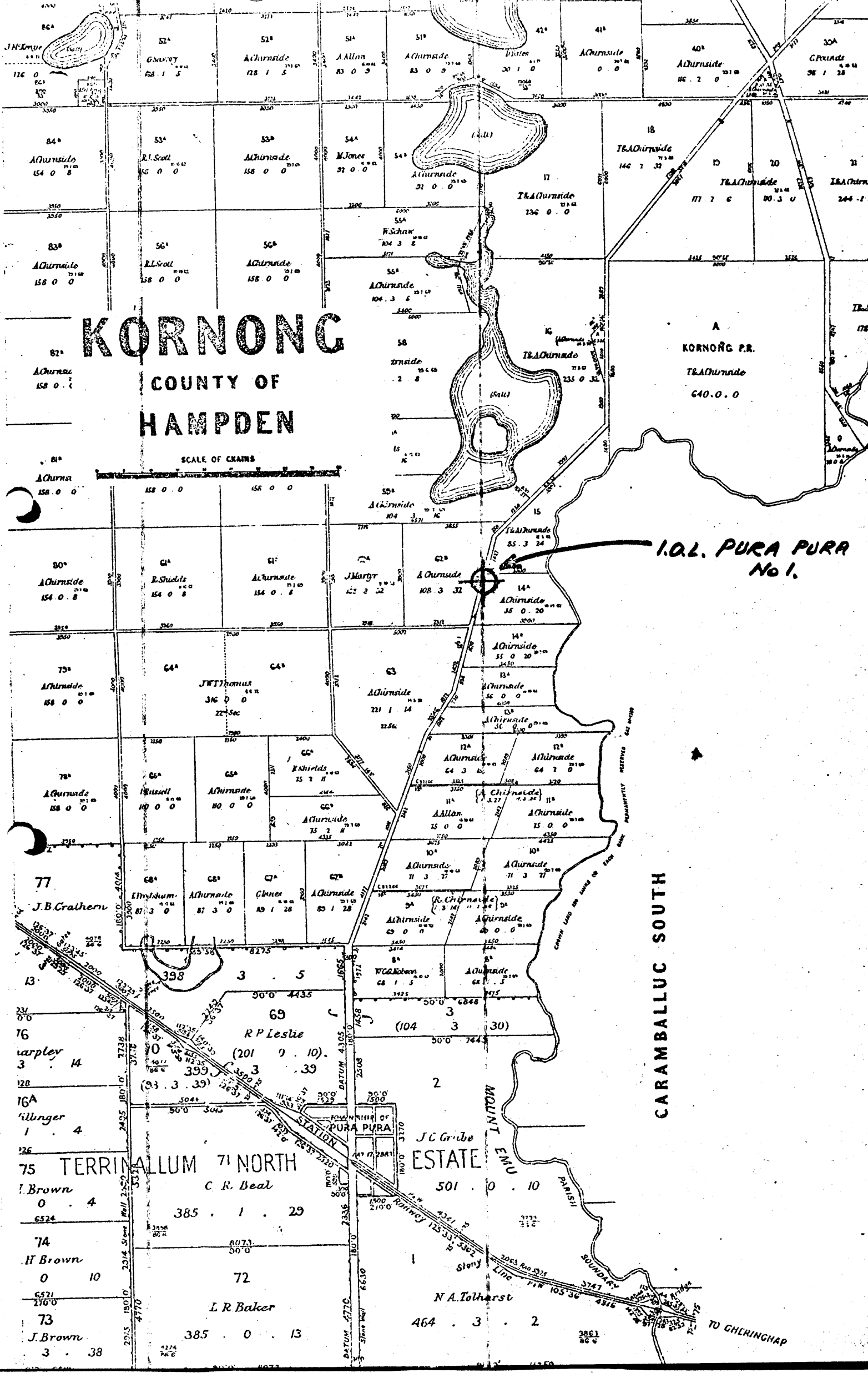
KORNONG COUNTY OF HAMPDEN

SCALE OF CHAINS

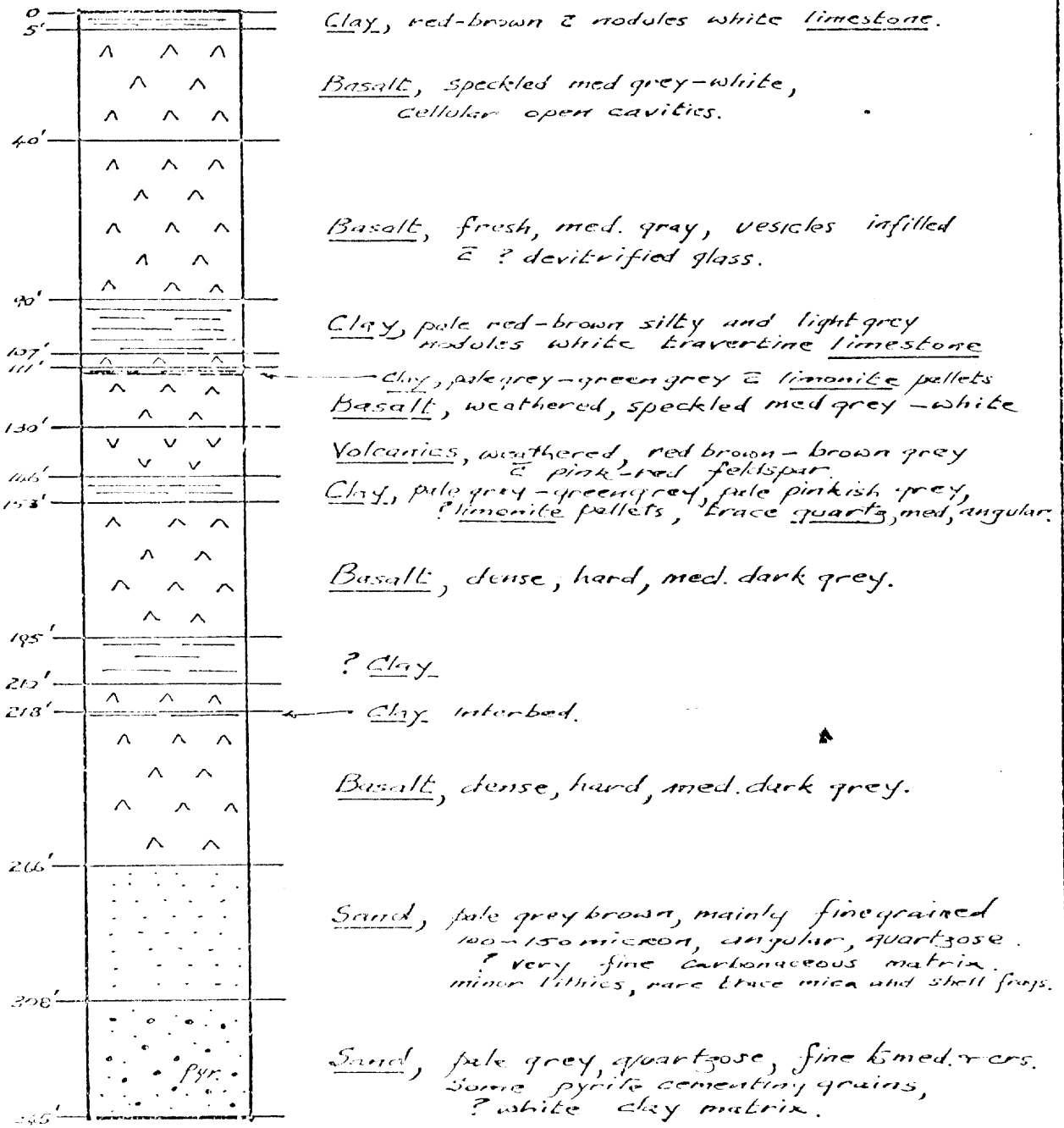


I.O.L. PURA PURA No 1.

CARBALLUC SOUTH



I.O.L. PURA PURA No. 2



Scale. 1 inch to 50 feet

Millers hog

Pura Pura #1

0-5'	Clay
5'-88'6"	Fresh basalt
88'6"-99'	Weathered basalt (water)
99'-102'6"	Clay and sand
102'6"-107'	Limestone (soft)
107'-111'	Basalt
111'-113'	Clay (pulled hammer tool)
113'-146'	Basalt (rock hit)
146'-153'	? softer (oily water)
153'-159'	Basalt (hard)
159'-195'	Basalt (very hard)
195'-210'	Softer, with few hard bands
210'-218'	Hard basalt
218'-220'	Softer formation
220'-230'	Very hard basalt
230'-240'	Hard basalt
240'-250'	Hard basalt (hammer tool)
250'-266'	Hard basalt.
266'-308'	Very fine sand
308'-345'	Coarse sand

INTERSTATE OIL LIMITED

Cuttings Description — Para Para #1

Footage.	Description
0-5	<u>Clay</u> red brown with nodules creamy white <u>limestone</u> .
5-10	90% <u>Basalt</u> speckled white and medium light grey, finely crystalline with reticulated intergrowths and open cellular vesicle and cavities. 10% <u>limestone</u> creamy white ? cavings.
10-20	100% <u>Basalt</u> as above
20-30	100% <u>Basalt</u> a.a.
30-40	100% <u>Basalt</u> a.a.
40-50	100% <u>Basalt</u> medium grey, finely crystalline non vesicular, cavities appear infilled with stony, micro crystalline grey green material ? devitrified glass.
50-60	as above
60-70	as above
70-80	as above
80-90	as above
90-100	A mixture of pale red brown <u>silty clay</u> , light grey <u>clay</u> and creamy white <u>travertine limestone</u>

(Drilling break at 88.5 feet depth with ingress of salty water).

100-110

as above plus some weathered basalt.

110-120

as above.

120-130

60% weathered Basalt speckled
medium grey and white
20% limestone creamy white, travertine
10% limonite pellets brown and
red brown (blackshot gravel)
10% Clay light grey - green grey

130-140

40% weathered volcanics red brown
brownish grey, finely crystalline with
pinkish red feldspar
20% Clay lt grey - green grey
20% limestone cream white
10% limonite pellets.

140-150

as above

150-160

60% Clay light grey, green grey,
pale pinkish grey.
20% limestone as above
10% limonite pellets
10% Basalt dense, hard, med dark
grey.

160-170

40% Clay a.a. ? casing.
10% limestone a.a. ? casing
10% limestone a.a. ? casing
40% Basalt a.a.

170-180

70% Clay pale pinkish grey to
light grey, light tan and mauve.
silty.
10% limestone a.a.
10% limonite pellets trace quartz, cla
10% Basalt a.a. ang to butang, ma

180-190 as above

190-200 a. a.

200-210 a. a.

210-220 a. a.

220-230 a. a.

230-240 a. a.

240-250 a. a.

250-260 a. a.

260-270 a. a.

(Killing break at 266 feet depth with color of water returns becoming dark green grey).

270-280

Plus 100 mesh sample a. a. (100 to 150 microns)
Predominantly minus 100 mesh & consisting
quartz, sand very fine to fine grained
mainly colorless, some slightly milky
angular to sub angular. ? finely divided
carbonaceous matrix w/c water coloration
Up to 10% lithics and dark heavy minerals give sample
a. a. an overall light brown coloration.

280-290

290-300

a. a. with some medium to coarse
grains of quartz, minor chert and lithics
subangular to well rounded.

(Color of water returns changed to
milky white at 308 feet depth,
with increase in average grain size).

300-310

Sand unconsolidated, predominantly
quartz very fine to coarse grained,
very angular, traces pyrite
? white kaolinitic matrix

310-320

a. a.

320-330

a. a.

330-340

a. a.

340-345

a. a.

Pura Pura - 1



ADDRESS ALL COMMUNICATIONS
CHIEF CHEMIST
TELEPHONE: 630221
GMC:MS

MINES DEPARTMENT
CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

An. HM, FF, 31/7

18th September, 1970

Report on Sample No. 1227/70

U.W.R.S. 7593

Sample : Bore Water
Locality : Parish Kornong
Sender : Interstate Oil Ltd.,
95 Collins Street,
MELBOURNE.

Particulars:

Bore	-
Plant	-
Sample	1
Date	30.6.70
Depth (feet)	220
Aquifer level (feet)	146-153 (Salty water zone)
Static level (feet)	Flowing
Drawdown (feet)	-
Aquifer type	-
Yield (gph)	300
Test type	-
Bore cased to (feet)	-
Position	2.5 miles north of Pura Pura
Owner	Interstate Oil Ltd.
Address	95 Collins St. Melb.
Remarks	Open Hole
Label No.	-

Results:

Parts per million

Total solids in solution	9111
Chloride (Cl)	4320
Carbonate (CO ₃)	31
Bicarbonate (HCO ₃)	314
Sulphate (SO ₄)	537
Nitrate (NO ₃)	Nil
Calcium (Ca)	23
Magnesium (Mg)	205
Sodium (Na)	2800
Potassium (K)	43
Iron-Total (Fe)	76
Iron-Soluble (Fe)	0.1
Silicate (SiO ₃)	37
Total hardness (as CaCO ₃)	904
pH	8.3
Electrical Conductivity at 25°C.	14302 micromhos/cm.
Specific Resistance at 21 °C.	79 ohmcm.

[Signature]
Chief Chemist

ADDRESS ALL COMMUNICATIONS
CHIEF CHEMIST
TELEPHONE: 630321



Pura Pura *R.L. (1277)*

MINES DEPARTMENT
CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

18th September, 1970

GMG:MS
An. HM, FF, 9/7

Report on Sample No. 1228/70

U.W.R.S. 7594

Sample : Bore Water
Locality : Parish Kornong
Sender : Interstate Oil Ltd.,
95 Collins Street,
MELBOURNE.

Particulars:

Bore	-
Plant	-
Sample	-
Date	1.7.70
Depth (feet)	345
Aquifer level (feet)	266-345
Static level (feet)	Flowing
Drawdown (feet)	-
Aquifer type	Porous quartz sand
Yield (gph)	5000
Test type	-
Bore cased to (feet)	Open hole to 345
Position	2.5 miles north of Pura Pura
Owner	Interstate Oil Ltd.
Address	95 Collins St. Melb.
Remarks	Open Hole.
Label No.	-

Results:

Parts per million

Total solids in solution	9014
Chloride (Cl)	4380
Carbonate (CO ₃)	Nil
Bicarbonate (HCO ₃)	356
Sulphate (SO ₄)	486
Nitrate (NO ₃)	Nil
Calcium (Ca)	29
Magnesium (Mg)	256
Sodium (Na)	2712
Potassium (K)	50
Iron-Total (Fe)	0.2
Iron-Soluble (Fe)	0.1
Silicate (SiO ₂)	33
Total hardness (as CaCO ₃)	1125

pH 7.4
Electrical Conductivity at 25°C. 14,163 micromhos/cm.
Specific Resistance at 21°C. 79 ohmcm.

Chief Chemist

WCR

Carranballac-1

(W597A)

CARRANBALLAC-1

APPENDIX III

Carranballac-1
WCR

INTERSTATE OIL LIMITED

WELL COMPLETION REPORT

CARRANBALLAC No. 1

W 597A

Carranballac - 1

GENERAL DATA

Well name and number : Carranballac^A No. 1

Name and address of Operator : Interstate Oil Ltd.
95 Collins Street
Melbourne. Vic. 3000

Tenement Holder : Interstate Oil Ltd.

Petroleum Tenement : PEP 76

District : Ballarat (1:250,000, SJ 54-8)

Parish : Kornong

Location : Approx. co-ordinates, 37°44'42" S
143°08'48" E
(See locality plan attached)

Elevation : Not determined - approx. 750'

Total depth : 495'

Date drilling commenced : 3rd July, 1970

Date total depth reached : 30th July, 1970

Date rig released : 30th July, 1970

Status : 30 ft. casing left in hole for
conversion to water bore by
landowner.

Drilling Contractor : W.L. Sides & Sons Pty. Ltd.

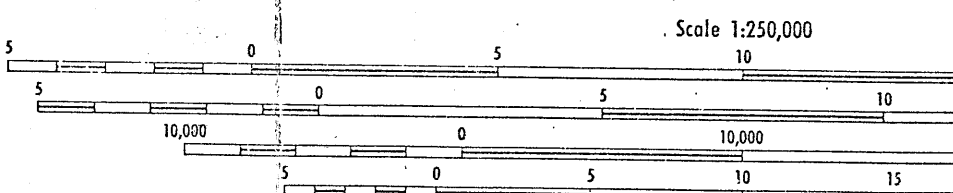
Drilling Plant : "Schramm" Model T64 H-B

Drilling fluid : Compressed air, surface to 337'
Bentonite mud, 337' to 495'

Total cost : Approx. \$7,015



6 MI MORTLAKE 15 MI CAMPERDOWN 18 MI CAMPERDOWN 20 MI

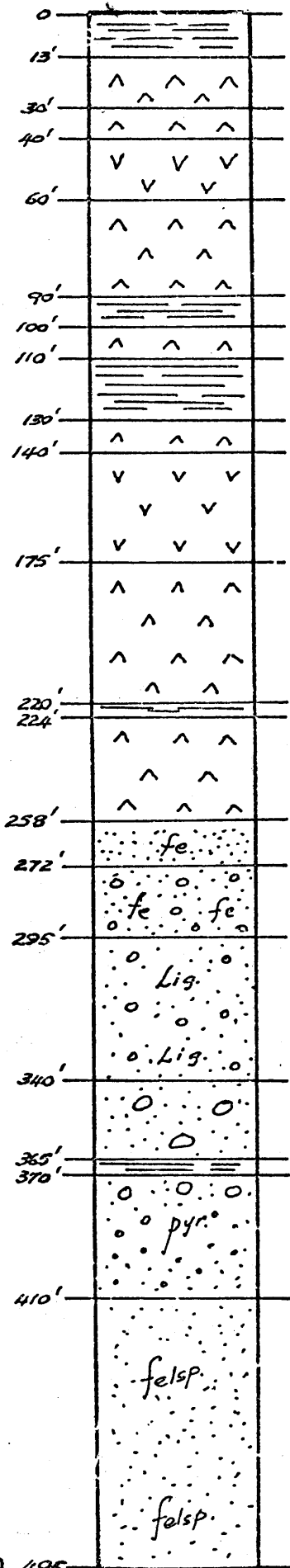


CONTOUR INTERVAL 250 FEET
 VERTICAL DATUM IS BASED ON LOW WATER MARK, HOBSONS BAY
 TRANSVERSE MERCATOR PROJECTION
 HORIZONTAL DATUM IS BASED ON SYDNEY OBSERVATORY, LATITUDE 33°51'41.10" S LONG

BLACK NUMBERED LINES INDICATE THE 10,000 YARD TRANSVERSE MERCATOR GRID, ZONES 6 AND
 THE LAST FOUR DIGITS OF THE GRID NUMBERS ARE OMITTED

1965 MAGNETIC DECLINATION FOR THIS SHEET VARIES FROM 9°30' EASTERLY FOR THE CENTRE OF THE SHEET TO 10°00' EASTERLY FOR THE CENTRE OF THE EAST EDGE. MEAN ANNUAL CHANGE

I.O.L. CARRANBALLOC No 1



Clay, buff with red-brown Limonite pellets

Basalt, medium grey, ? Olivine

Basalt, weathered, olive grey - yellow grey

Volcanics, weathered, pink to pale red brown, olive grey.

Basalt, fresh, medium dark grey to green grey
 Vesicles infilled \bar{c} ? devitrified glass.

Clay, green-grey, sandy \bar{c} quartz granules.

Basalt, weathered.

Clay, yellow grey to light brown, silty to sandy
 \bar{c} some coarse quartz granules.

Basalt, fresh, medium grey.

Volcanics, weathered, pale red brown to brick red.

Basalt, hard, dense, medium dark grey

Clay, sandy

Basalt, very hard, dense, medium dark grey.

Sand, yellow grey to tan, fine to very coarse, fe staining, lenticular matrix, predominantly quartz, minor lithics.

Sand and Gravel, yellow grey to tan lenticular matrix, subangular to well rounded trace mica and rare shell fragments.

Sand and Gravel, grey, angular to subangular subordinate Clayey Sandstone, pale grey minor Carbonaceous Siltstone, dark brown. common Lignite fragments, dark brown-black

Sand, med to coarse and Gravel, quartzose, angular to subangular matrix of white micaceous clay

Clay, pale grey, soft puggy, sandy, micaceous, sl. cont.

Sand, fine to coarse, and Gravel quartzose, angular to subangular pyrite cementing some grains

Sand, fine to med to coarse, quartzose mainly angular. common white feldspar fragments increasing with depth to 10% ? white micaceous clay matrix

(T.D.) 495

Scale. 1 inch to 50 feet.

INTERSTATE OIL LIMITED

Drillers log — Carran well^a #1

0 - 13'	Top soil
13' - 30'	Basalt
30' - 47' 6"	Shale or decomposed basalt
47' 6" - 130'	decomposed basalt
130' - 135'	Hard basalt (2000-3000 gph water)
135' - 159'	Hard basalt to 175' (more water)
220' - 224'	soft
240'	very hard basalt.
258'	top of sand.
272'	Hard granite
310' - 330'	Coarse quartz sand and coal.

yellow brown water at 258'
dark green grey water at 296'

N.B. Log incomplete due to five
different changes of driller
during operations at this site.

Cuttings Description — Carranballac² #1

Footage	
0-10	70% <u>Clay</u> cream to buff, silty. 30% <u>limonite pellets</u> red brown, 'buckshot'.
10-20	<u>Basalt</u> medium grey, partly weathered to cream or tan. some yellow green <u>? olivine</u> .
20-30	weathered <u>Basalt</u> , light olive grey to yellow grey.
30-40	as above
40-50	Weathered <u>Volcanics</u> pink to pale red brown and light olive grey.
50-60	as above, some green-grey basalt with stony microcrystalline material. <u>? devitrified glass</u> . trace calcite vein.
60-70	<u>Basalt</u> medium dark grey to green grey. fairly fresh with minor <u>? devitrified glass</u> traces calcite veining.
70-80	<u>Basalt</u> as above
80-90	<u>Basalt</u> dark grey, hard. Minor <u>volcanic</u> weathered, bricks red. traces calcite as veins and infilling vesicles.
90-100	Mixed sample consisting: 40% <u>Basalt</u> dark grey - green grey a. a. 40% <u>Volcanics</u> pale red brown, weathered also bricks red as above. 10% <u>Clay</u> greenish grey 5% <u>Quartz</u> , med to co interlocking grains 5% <u>Calcite</u> , white.

100-110

Weathered Basalt, light olive grey to medium grey and brown grey.
some inclusions of ? devitrified glass.

110-120

Clay yellow grey to light brown, silty to sandy with occasional coarse quartz granules.

120-130

50% Clay as above
50% Basalt medium grey, fairly fresh.

130-140

80% Clay as above
20% Basalt as above.
(water ingress 2000 to 3000 g.p.h.).

140-150

50% Clay as above
50% Volcanics pale red brown as above
traces brick red volcanics a.a.

150-160

As above.

160-170

80% Volcanics a.a.
20% Clay a.a.

170-180

40% Basalt medium grey to olive grey weathered in part
30% Volcanics pale red brown a.a.
30% Clay green grey to lt olive grey with some coarse quartz granules including rose quartz.

180-190

As above

190-200

60% Basalt as above
40% Clay as above

200-210

60% Basalt as above
 30% Clay as above
 10% Volcanics as above.

210-250

Basalt hard, dense med dark grey.
 Severe sample contamination due
 to washing out of surface hole
 behind stand pipe.

250-260

Missed sample.
 (Drilling break at 258' with color
 change of water returns to dirty
 yellow brown).

260-270

Sand yellow grey to tan, fine to
 coarse grained with some granules,
 poorly sorted, angular to subrounded
 predominantly quartz colorless to milky
 with Fe staining and lateritic
 cementing of grains. Subordinate
 lithic grains.

Basalt, volcanics & clay cavings

270-280

As above

280-290

Sand and Gravel yellow grey to tan,
 fine to very coarse with granules and
 pebbles 4 to 8 mm. Angular to
 well rounded, predominantly quartz
 colorless to milky. Common Fe staining.

290-300

Sand, pale yellow brown, very fine
 to fine grained, well sorted, mainly
 angular, predominantly quartz colorless
 to lt grey, milky and yellowish. Traces
 of mica, rare shell fragments.
 (Color change in water returns at 296' to dark green)

300-310

Sand, yellow grey to tan, fine to coarse grained, poorly sorted, angular to sub rounded, predominantly quartz grains colorless to light grey, milky and pale yellow, some fe. coating.

310-320

Quartz Sand colorless to milky, medium to coarse grained, angular to sub angular traces sandstone pale grey consisting very fine grained quartz poorly cemented with non calcareous grey micaceous clay matrix. Common Carbonised wood and lignite fragments up to 3 inches long.

320-330

Quartz Sand and Gravel, colorless to milky fine to coarse grained, angular to sub angular quartz.

Strong trace sandstone pale grey, fine quartz grains in micaceous clay cement.

trace lignitic material & pyrite
trace brown micaceous carbonaceous siltstone.

Occasional milky quartz pebbles up to 15 mm. sub rounded to rounded

Same

330-340

Quartz Sand and Gravel, light grey to colorless, med to coarse grained with granules and pebbles to 15 mm, sub rounded to well rounded.

Strong trace lignitic material

trace brown micaceous carbonaceous siltstone

(Water returns changed to milky white at 340')

340-350

Quartz Sand light grey, medium to very coarse grained and granule, angular to subangular
 Strong trace lignite
 Common white micaceous clay matrix

350-360

Quartz Sand as above
 traces fine grained, silty micaceous quartz sandstone
 Common large pebble size fragments of angular metamorphic quartzite dark brown to brown grey in color
 traces lignite

360-370

As above, very dirty and mixed sample. due to casing operations.

365-370 'core annulus sample' recovered at surface after advancing casing beyond drilled depth & later drilling ahead.

Pale grey, silty, sandy, gritty, micaceous clay, some finely divided carbonaceous material.

370-380

Quartz Sand and Gravel fine to very coarse grained, granule and pebble colorless to milky and pale grey angular to subangular
 Strong trace pyrite cementing grains

380-390

as above

390-400

as above (mainly med to coarse grain)

400-410

as above (becoming finer in grain size)

Carranballac-1

410-420

As above, probable white to pale grey
micaceous kaolinitic clay matrix
trace feldspar as white angular
grains

420-430

As above with increasing white
feldspar grains and fragments.

430-445

As above with upto 10% white
feldspar fragments.

ADDRESS ALL COMMUNICATIONS
 CHIEF CHEMIST
 TELEPHONE: 630821



Carranballac-1

MINES DEPARTMENT
 CHEMICAL BRANCH
 5 PARLIAMENT PLACE
 MELBOURNE, VIC. 3002

GMG:MS

An. HM, FT, 31/7

29th September, 1970

Report on Sample No. 1226/70

U.W.R.S. 7592

Sample : Bore Water
 Locality : Parish Kornong
 Sender : Interstate Oil Ltd,
 95 Collins Street,
 MELBOURNE.

Particulars:

Bore	Carranbellac ^a No. 1
Plant	-
Sample	-
Date	6.7.70
Depth (feet)	240
Aquifer level (feet)	-
Static level (feet)	Flowing
Drawdown (feet)	-
Aquifer type	Basalt and clays
Yield (gph)	5000
Test type	-
Bore cased to (feet)	Open hole to 240
Position	3 miles south of Carranbellac ^a
Owner	Interstate Oil Ltd.
Address	95 Collins Street, Melb.
Remarks	-
Label No.	-

Results:

Parts per million

		Parts per million
Total solids in solution		2268
Chloride	(Cl)	1058
Carbonate	(CO ₃)	Nil
Bicarbonate	(HCO ₃)	336
Sulphate	(SO ₄)	20
Nitrate	(NO ₃)	Nil
Calcium	(Ca)	43
Magnesium	(Mg)	121
Sodium	(Na)	587
Potassium	(K)	14
Iron-Total	(Fe)	9
Iron-Soluble	(Fe)	0.1
Silicate	(SiO ₃)	50
Total hardness (as CaCO ₃)		606
pH		7.4
Electrical Conductivity at 25°C.		3875 micromhos/cm.
Specific Resistance at 21°C.		292 ohmcm.

Chief Chemist

ADDRESS ALL COMMUNICATIONS
CHIEF CHEMIST

TELEPHONE: 630821

GLIG: 113

An. 11M, DL, 31/8



K.J.H.
R.B.L. (95)
MINES DEPARTMENT
CHEMICAL BRANCH
5 PARLIAMENT PLACE
MELBOURNE, VIC. 3002

23rd October, 1970

Carranballac 1

Report on Sample No. 1342/70

U.W.R.S. 7618

Sample : Bore Water
Locality : Parish Kornong
Sender : Interstate Oil Ltd.,
95 Collins Street,
MELBOURNE.

Particulars:

Bore	1
Plant	-
Sample	-
Date	28.7.70
Depth (feet)	335
Aquifer level (feet)	-
Static level (feet)	-
Drawdown (feet)	-
Aquifer type	-
Yield (gph)	-
Test type	-
Bore cased to (feet)	335
Position	35 miles south of Carranballac adjacent to entrance of Moonallan (station A. Chiryside).
Owner	Interstate Oil Ltd.
Address	95 Collins St. Melb.
Remarks	Sample displaced to surface by air
Label No.	-

Results:

	Parts per million	me/litre	
Total solids in solution	2256		
Chloride (Cl)	1049	29.5	
Carbonate (CO ₃)	18	0.6	
Bicarbonate (HCO ₃)	299	4.9	
Sulphate (SO ₄)	136	2.8	
Nitrate (NO ₃)	Nil	-	
Calcium (Ca)	48	2.4	
Magnesium (Mg)	116	9.5	
Sodium (Na)	590	25.6	
Potassium (K)	18	0.4	
Iron-Total (Fe)	1.4	-	Total Anions 37.9
Iron-Soluble (Fe)	0.1	-	Total Cations 37.9
Silicate (SiO ₃)	5	0.1	
Total hardness (as CaCO ₃)	595		

pH 8.0

Electrical Conductivity at 25°C. 3855 micromhos/cm.

Specific Resistance at 17.9°C. 296 ohmcm.

Chief Chemist

PALYNOLOGICAL EXAMINATION OF BORE SAMPLE.

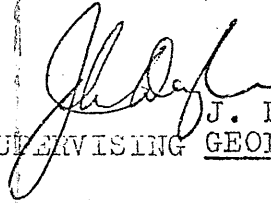
Samples from the ..Carranballac... Bore No. 1.....
 were treated by the hydrofluoric acid - Schulze's
 solution method, and the residues examined under the
 microscope for acid insoluble microfossils.

Sample Details.

<u>Bore No.</u>	<u>Rock Type</u>	<u>Depth</u>	<u>Microfossils.</u>
		310ft.	<u>Nothofagus</u> spp. <u>Trioritites</u> sp. <u>Proteacidites</u> sp. etc.
		335 ft.	None noted
		365-370ft.	Rare <u>Nothofagus</u> pollens etc. fern spores.

Remarks

A moderately rich microfloral assemblage was isolated
 from the 310 ft. sample. Nothofagus spp. were common and indicate
 a Lower Miocene - Oligocene age. The two deeper samples also
 appear to be of this age.


 J. DOUGLAS.
SUPERVISING GEOLOGIST.

ENCLOSURES for

*** Darlington-1**

*** Pura Pura-1**

*** Carranballac-1**

PE907101

This is an enclosure indicator page.
The enclosure PE907101 is enclosed within the
container PE907100 at this location in this
document.

The enclosure PE907101 has the following characteristics:

ITEM_BARCODE = PE907101
CONTAINER_BARCODE = PE907100
 NAME = Compilation Map (PEP 76)
 BASIN = OTWAY
 PERMIT = PEP/108
 TYPE = TITLE
 SUBTYPE = PERMIT_MAP
DESCRIPTION = Compilation Map for PEP 76 (enclosure
 from Combined WCR) for the 3 Scout
 Drill Holes...Darlington-1, Para Para-1
 and Carranballac-1
REMARKS = Map shows Permit boundary, the 3 Scout
 Drill Holes, Mesozoic Outcrop, Gravity
 Contours, Volcanic Cones, Water Bores
 and Section Lines.
DATE_CREATED = 31/07/70
DATE_RECEIVED =
 W_NO = W594A, W596A, W597A
 WELL_NAME = Darlington-1
 CONTRACTOR = Interstate Oil Ltd
 CLIENT_OP_CO = Interstate Oil Limited

(Inserted by DNRE - Vic Govt Mines Dept)

PE907102

This is an enclosure indicator page.
The enclosure PE907102 is enclosed within the
container PE907100 at this location in this
document.

The enclosure PE907102 has the following characteristics:

ITEM_BARCODE = PE907102
CONTAINER_BARCODE = PE907100
 NAME = Well Correlation Section
 BASIN = OTWAY
 PERMIT = PEP/108
 TYPE = WELL
 SUBTYPE = WELL_CORRELATION
DESCRIPTION = Well Correlation for PEP 76 (enclosure
 from Combined WCR) for the 3 Scout
 Drill Holes...Darlington-1, Para Para-1
 and Carranballac-1
REMARKS =
DATE_CREATED = 31/10/70
DATE_RECEIVED =
 W_NO = W594A, W596A, W597A
 WELL_NAME = Darlington-1
CONTRACTOR = Interstate Oil Ltd
CLIENT_OP_CO = Interstate Oil Limited

(Inserted by DNRE - Vic Govt Mines Dept)