



GEELONG

FLOW

OIL - 1

Well Summary

Geelong Flow Oil-1

(W439)

GEELONG FLOW OIL-1

W439

**WELL SUMMARY  
GEELONG FLOW OIL-1  
(W439)**

**Contents.....**

**Appendix:**

- 1.0 Well Card
- 2.0 Lithology
  - 2.1 Lithological Descriptions 0-2050'
  - 2.2 Lithological Log
  - 2.3 Stratigraphic column
  - 2.3 Preliminary Report
- 3.0 Geochemistry
  - 3.1 Report on Rocks and Gas
  - 3.2 Report on Sample 594/49

Tue Mar 15 09:41:50 1994

UT103M  
tam

GEDIS - Utilities Sub-System  
Note Text Editing

Update

-----  
Reference No. 18534 (Note 23283) Owner tam Updated tam  
Cat. CATLG Sub.Cat. Private N Confidential N  
Subject Catalogue-Basin Studies Open File  
1 Links 3 Rows

-----+  
Note Text

- 1. Report. 'Report on...Geelong Oil Flow...' [Ref Id. 19555]
  - 2. Report. 'Report on...Geelong Oil Flow...' [Ref Id. 19562]
  - 3. Lithology. [LITH 1, LITH 2.]
- +

1.0 Well Card.

PE904198

This is an enclosure indicator page.  
The enclosure PE904198 is enclosed within the  
container PE904197 at this location in this  
document.

The enclosure PE904198 has the following characteristics:

ITEM\_BARCODE = PE904198  
CONTAINER\_BARCODE = PE904197  
NAME = Well Card  
BASIN = OTWAY  
PERMIT =  
TYPE = WELL  
SUBTYPE = WELL\_CARD  
DESCRIPTION = Well Card Geelong Flow Oil 1  
REMARKS =  
DATE\_CREATED = 31/03/48  
DATE\_RECEIVED =  
W\_NO = W439  
WELL\_NAME = Geelong Flow Oil-1  
CONTRACTOR =  
CLIENT\_OP\_CO = Geelong Flow Oil Co

(Inserted by DNRE - Vic Govt Mines Dept)

## 2.0 *Lithology*

From Original drillers Log. P. 6.

Drilled by Southern States Drilling Co. Pty Ltd.

location allot 57. Ph. Pueblo. (Previously PPh. 141)  
 at ~~1535' - Dec 1948~~ (at 1535' - Dec 1948.)  
 at 1990 - Dec 1949

Spudded March 1948.

abandoned 20 Jan 1950

Carded

Soil	0 - 1
Red clays	1 - 15
Red sandy clay	15 - 33
White sandy clay (water)	33 - 43
Yellow clay (sandy)	43 - 47
Yellow clay	47 - 70
Grey silty clay with bands of limestone	70 - 90
Dark silty clay	90 - 120
Marl	120 - 150
Marl with bands of limestone (water)	150 - 306
Marl	306 - 325
Layers of stone & marl.	325 - 385
Sticky Marl.	385 - 405
Marl	405 - 525
Very Sticky Marl	525 - 535
Marl	535 - 860
Igneous rock	860 - 867
Igneous sand	867 - 1130
Igneous clay	1130 - 1220
(Note by P.E.T. - Bedrock, Probably Jurassic 1200-1210' 16.8.48) 1210' - 1220'	1220 - 1260
Blue rock	1220 - 1260
Igneous clay (Note. P.E.T. 20.9.48 - The samples are mudstones and sandstones belonging to the Jurassic)	1260 - 1290
Hard mudstone	1290 - 1535

144' 0" 19' 30" E  
 380' 18' 24" S  
 24  
 28  
 4.2  
 26  
 48  
 20.8

Blue slate ..... 1535-1800

(Note D.E.T. 16/49. 1590-1600 - black carbonaceous mudstone containing fossil plants of Jurassic age.)

No sample - Reported that sludge, now being brought up by the "bailer" from the bottom of the bore, is of high temperature and contains gas which ignites when a lighted match is applied to the top of the "bailer". Earth washes off drill when being drawn to the surface of the bore. The samples last obtained have been a grey earth, at 1800' the strata has hardened considerably and is a hard sandstone ..... (1800-1810)

Grey sandstone ..... 1800-1810  
(Sludge in bailer ignites when a lighted match is applied).

Iron pyrites (Note D.E.T. Jurassic ss. & mudstone 299.49) ..... 1810-1830.

Blue clay ..... 1830-1910

(Note D.E.T. 22-11-49 - 1900-1910' contain some bituminous coals.

Thickness cannot be determined for samples by percussion drilling)

Blue slate ..... 1910-1940

Blue clay ..... 1940-2050.

(Note D.E.T. 23-1-50. at 2030' some fragments of coal.)

Samples at 10' intervals from ~~790~~ 790-2050'



GEELONG FLOW OIL CO. LTD.

NO. I. BORE.

Lithological Log.

(Copied from Original Driller Log by N.J. Coulson<sup>e//</sup>.)

0'	-	1'	Soil	
1'	-	15'	Red Clays	
15'	-	33'	Red Sandy Clay	
33'	-	43'	White Sandy Clay (Water)	
43'	-	47'	Yellow Clay (Sandy)	
47'	-	70'	Yellow Clay	
70'	-	90'	Grey silty Clay with bands of limestone	
90'	-	120'	Dark silty clay	
120'	-	150'	Marl.	
150'	-	306'	Marl with bands of limestone (Water)	
306'	-	325'	Marl	
325'	-	385'	Layers of Stone and Marl	
385'	-	405'	Sticky marl.	
405'	-	525'	Marl	
525'	-	535'	Very sticky marl	
535'	-	860'	Marl	
860'	-	867'	Igneous rock	
867'	-	1130'	Ligneous sand	
1130'	-	1220'	Ligneous clay	*
1220'	-	1260'	Blue clay	
1260'	-	1290'	Ligneous clay	*
1290'	-	1535'	Hard Mudstone	
1535'	-	1800'	Blue slate	*
(1800'	-	1810')	No sample, sludge with gas and grey earth*	
1800'	-	1810'	Grey Sandstone	
1810'	-	1830'	Iron Pyrites	*
1830'	-	1910'	Blue clay	
1910'	-	1940'	Blue slab	
1940'	-	2050'	Blue clay	*

\* The following notes were made by Dr. D.E. Thomas.

On 16:8:1948	1200'	-	1210'	-	1220'	-	Bedrock, probably Jurassic.
On 20:9:1948	1260'	-	1290'				The samples are mudstone and Sandstones belong to the Jurassic
1:6:1949	1590'	-	1600'				Black Carbonaceous mudstone containing fossil plants of Jurassic age.
29:9:1949	1810'	-	1830'				Jurassic sandstone and mudstone
22:11:1949	1900'	-	1910'				Contains some bituminous coals. Thickness cannot be determined for Samples by percussion drilling.
23:1:1950							At. 2030' some fragments of coal.

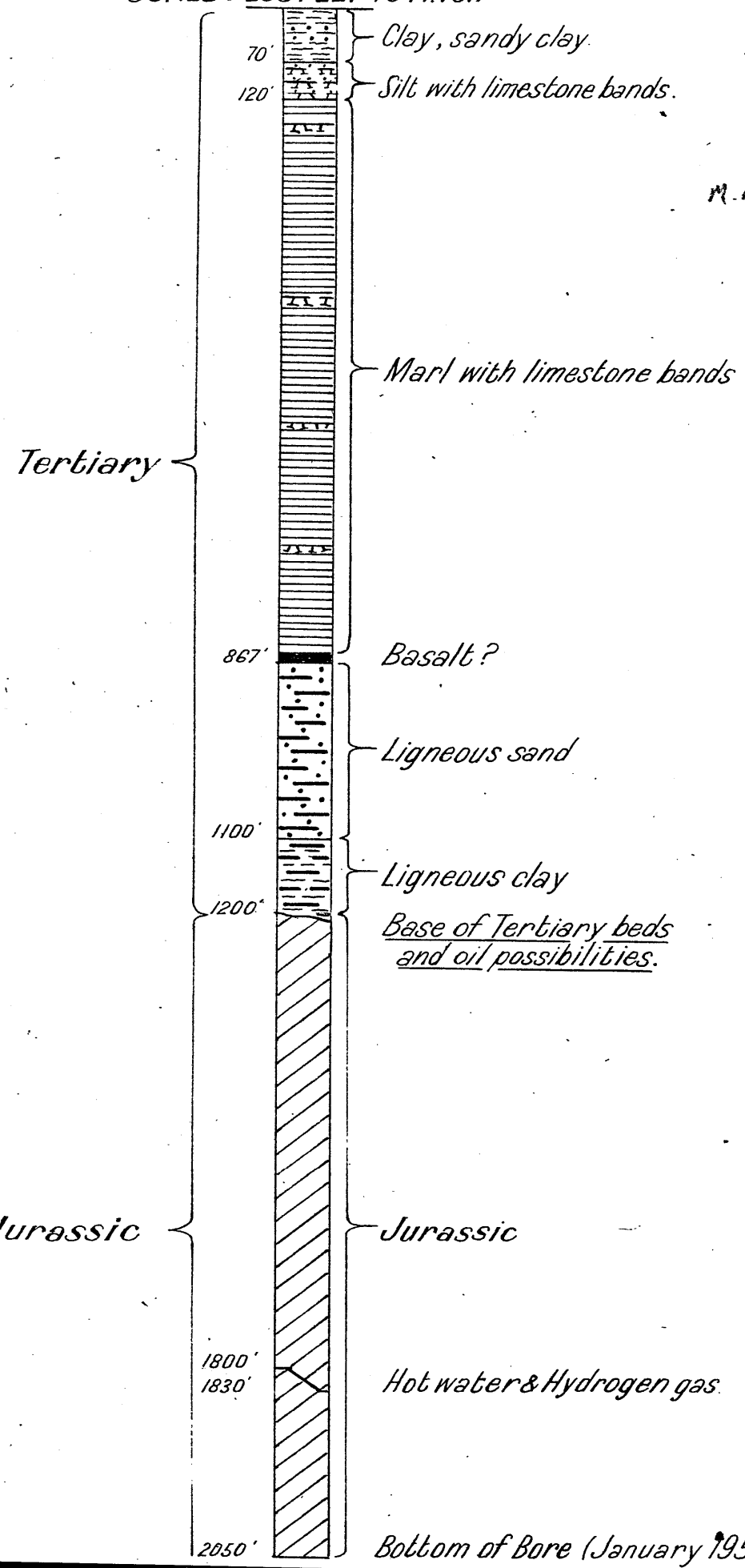
Original Driller log has recorded for the interval 1800' - 1810'. No Sample - The Sludge now being brought up by the "bailer" from the bottom of the bore, is of high temperature and contains gas which ignites when a lighted match is applied to the top of the "bailer".

Earth washes off drill when being drawn to the surface of the bore. The samples last obtained have been a grey earth. At 1800' the strata has hardened considerably and is a hard sandstone.

# GEELONG FLOW OIL CO. LTD

## Bore N°1 Parish of Puebla

SCALE : 200 FEET TO 1 INCH



*Geological notes:*  
 0-70 Pleist. Rec  
 70-230 Balcones  
 230-770 Ganges  
 770-1130 Anglian  
 1130-1200 Holen  
 1200 Jurassic

70'  
 120'  
 867'  
 1100'  
 1200'  
 1800'  
 1830'  
 2050'

*Tertiary*

*Jurassic*

PRELIMINARY REPORT ON SAMPLES FROM No. 1 BORE,ALLOTMENT 57, PARISH OF PUEBLA, VICTORIA,(GEELONG FLOW OIL CO).Report No. 1948/50.(Pal. Series No. 19).

This account of the micropalaeontological examination of samples received from this bore to date is presented as a preliminary report. The samples examined were taken from the surface down to the depth of 1,130 feet. The bore is being drilled by percussion methods and consequently there is some admixture of fossil species. However, towards the lower part of the bore, these adventitious species disappear and the species recorded are characteristic of the beds in which they are found.

The approximate limits of the various stratigraphic horizons recognised in the samples are as follows:-

Pleistocene to Recent	-	Surface down to 70 feet.
Middle Miocene	-	70 feet down to 1,130 feet.
Balcombian stage	-	70 feet down to 230 feet.
Janjukian stage	-	230 feet down to 770 feet.
Anglesean stage	-	770 feet down to 1,130 feet.

Pleistocene to Recent.

Seventy feet of reddish to ochreous, unfossiliferous sandstones of Pleistocene to Recent age overlie the marine Tertiaries.

Middle Miocene.1. Balcombian stage.

The yellowish limestone at 70-80 feet most probably represents the top of the Balcombian stage. From 80 feet down to 230 feet the rocks range from cream coloured limestones to grey marls containing numerous foraminifera. These beds apparently represent the lower portion of the Balcombian stage, typical zonal species being present. Operculina victoriensis is common at 210-220 feet and is present in most of the samples down to 230 feet in association with Cibicides victoriensis and Crespinella umbonifera.

2. Janjukian Stage.

The bore passes into Janjukian stage at approximately 230-240 feet when zonal foraminifera such as Massilina torouayensis are met with in grey marls. These grey marls persist down to 460 feet where the lithology changes to sandy marls containing Turritella aldingae. Typical foraminifera of the upper part of the Janjukian, Clavulinoides szaboi var. victoriensis, Liebusella antipodum, Sigmollina victoriensis are fairly common.

At 600 feet pyrites is prevalent in the samples and the marls change from grey to greenish-grey in colour. Fragments of small mollusca such as Turritella aldingae, and Murex polyphyllus occur occasionally. Glauconite grains are common at 640-670 feet.

The foraminiferal assemblage of the lower Bird Rock horizon occurs from 700 feet down to 770 feet, zonal species such as Massilina torouayensis, Victoriella plecte, Cyclammina incisa, and Sherbornina atkinsoni being recorded.

3. Anglesean Stage.

At approximately 700 feet the bore passes into the

Anglesean stage where it is represented by a coarse sandstone consisting of rounded to angular quartz grains. At 780 feet it passes into dark grey carbonaceous sandstone composed of fine angular quartz grains, and containing Ammodiscus sp. At 890 feet the lithology is a dark grey to brown, fine grained ligneous sandstone which is typical of the type Anglesean material, and which persists down to the last sample at 1,130 feet. Small foraminifera are present, their test being replaced with pyrites. Large tests of Cyclanmina occur from 1,000 feet down to 1,050 feet and the genus is present down to 1,120-1,130 feet, where it is common. A small fish tooth was found at 1,110-1,120 feet.

Canberra, A.C.T.  
13/8/48.

*I. Crespin*  
I. Crespin.  
Commonwealth Palaeontologist.

PRELIMINARY REPORT ON FURTHER SAMPLES FROM  
NO. 1 BORE ALLOTMENT 57, PARISH OF PUEBLA,  
VICTORIA.

(Geelong Flow Oil Co.)

Report No. 1948/65  
(Pal. Ser. No. 27)

The samples recently received for examination came from the depth of 1130 feet down to 1260 feet and were in continuation of the series reported upon on 13/8/48.

Based on lithological evidence, the present series of samples from the Geelong Flow Oil Bore apparently passed out of the Tertiary into the Jurassic at 1,200 feet, when the lithology changed from grey shales into a grey sandstone containing large quartz pebbles and fine angular grains of clear and milky quartz.

The samples from 1,130 feet down to 1,160 feet consisted of brown, lignitiferous sandstone typical of the Anglesean stage of the Tertiary and containing the characteristic Anglesean foraminifera Cyclammia. From 1,160 feet down to 1,200 feet pale grey sandstones and shales containing abundant pyrite were encountered and a specimen of Cyclammia, partially replaced with pyrite was present at 1,180-1,190 feet.

At 1,200 feet there was a sharp change in lithology, and sandstone similar to the grey sandstone of the Jurassic rocks in the Geelong area continued from this depth down to the last sample received at 1,260 feet.

*I. Crespin*

14th October, 1948.  
CANBERRA, A.C.T.

(I. Crespin)  
Commonwealth Palaeontologist.

### 3.0 *Geochemistry*

REPORT ON THE ROCKS AND THE INFLAMMABLE GAS COLLECTED  
FROM THE GEELONG FLOW OIL COMPANY'S WELL NEAR  
TORQUAY.

By N. Boutakoff, D.Sc.

The Geelong Flow Oil Company's Torquay cable-tool well passed out of ligneous basal Tertiary clay and entered bluish-grey shale at 1200-1210 feet, which Dr. D. E. Thomas considered at the time as being probably of Jurassic age. It continued in rocks of the same type and occasional hard sandstone, down to a depth of 1800 feet, reached on 2nd September, 1949, when high temperature and inflammable gas were reported to this Department. Both were mentioned again at 1810 feet, on the 10th September, 1949.

On the 14th September 1949, the writer paid a visit to the well, with the object of investigating the inflammable gas and of ascertaining, if possible, the age of the rocks being drilled through.

Inflammable gas was twice brought up with the mud by dart valve bailer and the mud was found to drop approximately 18 inches in the 20-ft. bailer, after the gas had tumultuously escaped from it. On this first visit, equipment for collecting gas from the bailer, was found to be inadequate under existing conditions.

The mud in the bailer was found to be hot and slightly steaming. A maxima thermometer was let down the well twice and recorded a temperature of 120 deg. F. at well bottom. A black coal scum was at that time floating over the mud released from the bailer.

Collecting at the bottom of the mud trough, brought to light several fragments of splintered grey shale, some containing plant remains and one also being traversed by a thin streak of black coal. The contents of the bailer were then thoroughly examined and from the second load of mud hoisted to the surface, six chips of fossiliferous Jurassic rock were secured, two being blue-grey sandstone and four blue-grey to black shale, all fragments containing numerous plant remains. The depth of the well at the time of collecting must have been around 1815 feet although the driller mentioned a depth of 1810 feet, which, according to drilling reports submitted to this Department, ~~was~~ was reached on 10th September.

On the 19th September 1949, a second trip was made to the

well in company of Mr. F. F. Field, Senior Chemist, Government Laboratories, with the object of securing a sizable sample of the inflammable gas. The well was then reported to have reached the depth of 1825 feet. A gas trap, designed by the writer, was used, consisting of an 8-ft. dart valve bailer, closed at the top with a welded-on steel lid, carrying a  $\frac{1}{2}$ -inch cock.

The bailer was let down the well with the cock open and spudded. As soon as it was hoisted to the surface, the gas at the cock head was bled until it ignited, thus removing traces of air. The cock was then locked, connected with a gallon water-filled bottle and gradually opened. Two bailings were found necessary to fill the bottle with gas.

Analyses of the gas are as follows:-

Hydrogen .....	63.1%	63.1%
Methane.....	19.8%	19.8%
Nitrogen.....	13.5%	14.2%
CO .....	1.4%	1.4%
CO <sub>2</sub> .....	0.7%	0.7%
O <sub>2</sub> .....	0.5%	0.5%
Ethane.....	0.7%	nil.
Unsaturated Hydrocarbon..	0.3%	0.3%
<u>Total.....</u>	<u>100%</u>	<u>100%</u>

Mr. Field's report is attached. This gas contains only traces of ethane and can in no way be taken as a favourable indication for oil or petroleum gas.

The large percentage of methane may be attributable to the presence of coal and carbonized plant remains in the rocks being drilled through.

The remarkably high percentage of hydrogen recalls to memory the hydrogen wells drilled in South Australia and thoroughly investigated by L. Keith Ward in 1933<sup>(1)</sup>. From this author we learn that two wells drilled for oil in South Australia, the first late in 1921 on Kangaroo Island and the second in 1931, east of Minlaton on Yorke

(1) L. Keith Ward - "Inflammable Gases occluded in the pre-Palaeozoic rocks of South Australia" (Transact. and Proc. Roy. Society South Australia, Vol. LVII, pp.42-47, 2 fig., Dec. 1933.)



Peninsula, encountered inflammable gas, mostly composed of hydrogen, in pre-Palaeozoic rocks, consisting in mica-schist, phyllite and quartz-mica-schist in the first case and Upper Pre-Cambrian limestone in the second. The depth interval was 615-950 feet, on Kangaroo Island, and 370-1,666 feet on Yorke Peninsula. The analyses given by Ward are as follows:-

Kangaroo Island

~~(1) At 615 feet~~

	(1) At 615 feet	(2) At 950 feet.
CO <sub>2</sub> .....	5.3%	0.52%
O <sub>2</sub> .....	4.3%	3.55%
Ethylene etc.....	0.5%	nil.
CO .....	nil	nil.
Hydrogen .....	53.3%	68.64%
Methane .....	2.6%	4.68%
Nitrogen .....	36.0%	22.61%
(by difference)		
Total.....	100 %	100 %

Yorke Peninsula (Minlaton) -

	I 790'	II 790'	III 860'	IV 860'	V 860'	VI 1,666'
CO <sub>2</sub> .....	0.8%	0.2%	0.8%	0.8%	0.6%	nil
O <sub>2</sub> .....	nil	nil	3.2%	2.4%	3.0%	1.2%
Ethylene etc... nil	nil	nil	nil	nil	nil	nil
CO .....	nil	nil	nil	nil	nil	nil
Hydrogen.....	74.0%	76.0%	60.0%	64.4%	60.0%	84.0%
Methane .....	7.5%	7.5%	5.4%	7.0%	5.6%	nil
Nitrogen .....	17.7%	16.3%	30.6%	25.4%	30.8%	14.8%
(by difference)						
Total .....	100%	100%	100%	100%	100%	100%

From correspondence between Ward and Chamberlin (Chicago University) quoted by Ward, (loc. cit. pp.46-47) it appears that the presence of methane and ethylene seems to suggest organic origin whereas the high proportion of hydrogen "rather suggests that it has come from inorganic sources". According to Chamberlin reactions between water and ferrous compounds at 100 deg. or 200 deg. temper-

ature would possibly account for the high proportion of hydrogen; at the same time "a slight rise in temperature would break up organic matter, giving rise to methane".

It may be recalled that a relatively high temperature has been recorded in the present bore, suggestive of hot water circulation along faults. It should further be mentioned that pyrites has been recorded in the well after the writer's visit, in the 1825'-1830' interval, together with warm water and inflammable gas. Chamberlin also mentioned (Ward loc. cit. p. 47) blowers of gas in some potash mines near Strassfurt, in which hydrogen is present in the proportion of 93 per cent.

The occurrence of hydrogen gas in a well near Torquay, Victoria, is of considerable scientific interest and again shows that this gas is widely distributed through a variety of rocks of vastly different ages.

The occurrence of oil in the fresh-water Jurassic of Torquay is considered as highly improbable, on account of the non-petroliferous nature of the overlying Tertiary beds and of the underlying Ordovician slates. The deepening of the well near Torquay is extremely unlikely to yield profitable results and therefore cannot be recommended.



Senior Geologist.

26th September, 1949.

3rd October, 1949.

Report on Sample No. 594/49.

Sample - Natural Gas  
Locality - Torquay  
Sender - Dr. N. Boutakoff, Mines Department,  
MELBOURNE, C.2.

Geelong Flow Oil Co. - Bore at Torquay, Depth 1825 feet.

The sample was collected on Monday September 19th, 1949 from an improvised bailer specially designed for this purpose.

Owing to the unusual type of this gas, opportunity was taken to have an analysis made at the Metropolitan Gas Co. Laboratory, where better facilities are available for this class of work. The analysis of the gas is as follows:-

	<u>%</u>
CO <sub>2</sub>	0.7
O <sub>2</sub>	0.5
CnHm	0.3
CO	1.4
CH <sub>4</sub>	19.8
H <sub>2</sub>	63.1
N <sub>2</sub>	14.2
Total	<u>100.0</u>

The gas has no smell and burns with a non-luminous flame.

*F. L. Reid*  
Senior Chemist, Mines Department.