



Natural Resources and Environment

AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT



HALIBUT - / (G.B) WELL SUMMARY

(ESSO)

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HALIBUT - 1

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WELL DISCOVERY REPORT

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ESSO HALIBUT A-1 WELL SUMMARY

Purpose of Well: New field Wildcat, Gippsland Basin, to test an anticlinal feature mapped by seismic. The Eocene unconformity shows 600 feet of vertical closure, covering an area of 17 square miles. The closure is dependent on the unconformity surface, for the east part of the structure. It is a result of structural dip and erosion by a major canyon filled with sediments of the Lakes Entrance Formation. The upper cretaceous is dependent, as well, on this canyon for east closure. The Lakes Entrance Formation shows 300 feet of vertical closure over an area of 7 square miles. This formation is thinning over the Halibut structure, indicating a late Eocene or early oligocene structural movement. Primary objective was the sand within the Latrobe Valley Formation. Secondary objective was the sand development within the upper cretaceous.

Well Statistics:

Type of Well: Exploratory Test.

23' 38° 58" Latitude Location:

Longitude 148° 18' 57" E

At seismic shotpoint 8140 Line ET-95

Rotary table 31 feet above mean sea level. Elevation:

224 feet. Water Depth:

June 20, 1967. Spudded:

September 25, 1967. Completed:

10,011 feet. Total Depth:

Plugged and suspended. Well Status:

30" 376 ft. to Casing: 20" 746 ft. to

 $13^3/8$ " to 2515 ft. $9^{5}/8$ " to 8624 ft.

2 shots/ft. 7800 - 7804 ft. Perforations: 2 shots/ft. 7890 - 7894 ft.

1. Casing plug at 8450-8750 ft., using Plugs: 127 sacks of Aust. N. Cement, 0.4% NR4, 0.75% CFR2, 15.6 lbs/gallon.

> 2. 2300-2600 ft., using 100 sacks of cement, 15.4 lbs/gallon.

3. 490-290 ft.

Cores:

1 core at 5500-5523 ft.

15 cores in the interval 7550-7960 ft.

Cut 433 ft., recovered 310.5 ft.

Mud Log:

The well was logged by Core Laboratories

from 800 feet to total depth.

Electric Logs:

750 - 10006 ft.

MLL 7450 - 8670 ft.

LL 7450 - 8668 ft.

BHC-SGR 749 - 9997 ft.

GRN 7400 - 8100 ft.

CDM 750 - 8667 ft.

FDC 750 - 10005 ft.

TL 1000 - 6000 ft.

CBL 7400 - 8624 ft.

Hydrocarbons:

<u>Interval</u> <u>Gross</u> <u>Net</u> <u>Type</u>. 7490-7905 ft. 415 ft. 311 ft. Oil

Testing:

Wire Line Formation Tests:

Test 1. 7948 ft.

Recovered: - 19900 cc water with a salinity of 14,000 ppm (15% formation water and 85%

filtrate); 600 cc mud. RW = 0.527 at 67° F.

Test 2.

7911 ft.

Seal failure.

Test 3.

7893 ft.

Mechanical failure.

Test 4.

7893 ft.

Recovered:- 20.050 cc of water with a

salinity of 6300 ppm (filtrate),

400 cc mud.

 $RW = 1.06 \text{ at } 69^{\circ} \text{ F.}$

Test 5.

7786 ft.

Recovered:- 12,750 cc oil, A.P.I. 41.5°, 5500 cc water (filtrate), salinity 4900 ppm.

500 cc mud.

RW = 1.51 at $61^{\circ}F$.

Test 6.

7690 ft.

Recovered:- 800 cc oil, 17,900 cc water (filtrate), with salinity 3500 ppm;

1500 cc mud.

 $RW = 1.47 \text{ at } 83^{\circ} \text{ F.}$

Test 7.

7912 ft.

Recovered: - 20,000 cc water (filtrate),

salinity 4500 ppm; 500 cc mud;

trace of gas, scum of oil. RW = 1.65 at 66° F.

Test 8.

7565 ft.

Recovered: - 3000 cc oil, A.P.I. 38°; 11,000 cc water (filtrate), salinity 4500

ppm; 400 cc mud. RW = 1.62 at 60° F.

Production Testing:

Zone 1.

7890 - 7894 ft.

Bad weather and mechanical problems hampered testing of this interval, which then had to be abandoned.

Zone 2.

7800 - 7804 ft.

Packer was set at 7730 ft. The interval was perforated and the well flowed at rates up to 3230 B.O.P.D. through a ½" choke. Gravity - 43.8° A.P.I.; sand = nil, water = nil; wax = nil, G.O.R. = nil, FBHP = 3494 p.s.i.; SIBHP = 3623 p.s.i.

Stratigraphy:

<u>Age</u>	<u>Formation</u>	Top (RT)	Subsea	Thickness
Miocene	Gippsland Fm.		- 224	
Oligocene	Lakes Entrance Fm.	7010	- 6979	480
Eocene	Latrobe Valley Fm.	7490	- 7459	2521 +
	O.W.C.	7905	- 7874	
	T.D.	10011	- 9980	

Lithology:

Gippsland Formation

800 - 5611 Interbedded <u>marl</u> and <u>limestone</u>.

<u>Limestone</u>: skeletal, granular, <u>Marl</u>: grey, silty, very fossiliferous, partly grading to <u>micritic limestone</u>.

Thin beds of shaly sand and siltstone.

5611 - 7010 <u>Calcareous mudstone</u>:

Soft, fossiliferous, dense, glauconitic, trace of argillaceous, calcareous siltstone, Some skeletal limestone, coarse, granular, glauconitic.

(5750 - 5760: argillaceous dolomite.)

Lakes Entrance Formation

7010 - 7490 <u>Calcareous mudstone</u>: soft, dense, fossiliferous, glauconitic.

<u>Calcareous shale</u>; grey, fairly well compacted, micaceous, fine carbonaceous flecks.

..../4

Latrobe Valley Formation

7490 - 7597 Interbedded <u>sandstone</u>, <u>siltstone</u>, <u>shale</u> and <u>coal</u>.

<u>Sandstone</u>: brown, grey, loose quartz grains, fine to very coarse, rounded to subrounded, poorly sorted, clay matrix, micaceous. Also aggregates of sandstone, fine well sorted, argillaceous.

Shale: grey, carbonaceous.

Coal: black.

Siltstone: dark brown, micaceous.

7597 - 7786 <u>Quartz-wacke</u> - <u>Quartz-arenite</u>, interbedded with <u>shale</u>. Some shaly sandstone with clay matrix.

Quartz-wacke: medium to coarse, subangular,
tight, silty. Partly bonded, unconsolidated,
friable.

<u>Shale</u>: brown-grey, reworked, pyritic, fissible, micaceous, carbonaceous.

7786 - 8700 Interbedded <u>sandstone</u>, <u>shale</u> and <u>coal</u>.

<u>Sandstone</u>: moderately well sorted, fine to medium, subrounded to subangular, shaly, silty.

Shale: grey, silty, sandy, partly calcareous, carbonaceous.

8700 - 9390 Interbedded <u>shale</u>, <u>siltstone</u>, <u>sandstone</u>, coal and some <u>white clay</u>.

<u>Sandstone</u>: coarse to pebbly, granular quartz, pyritic, subangular.

Siltstone: grey-brown.

White clay: soft, ashy, crumbly, with
pyrite.

Shale: brown, carbonaceous.

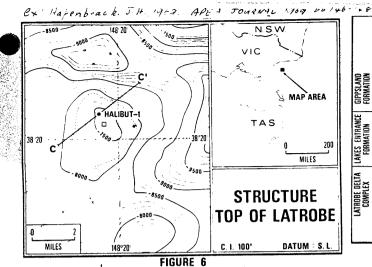
9390 - 10,011 (T.D.)

Interbedded shale, sandstone and coal.

Shale: brown, silty, carbonaceous.

<u>Sandstone</u>: grey, fine to very fine, tight, carbonaceous, argillaceous. Also loose quartz, coarse to very coarse, subangular (with asphalt stains).

Some coal, some white clay.



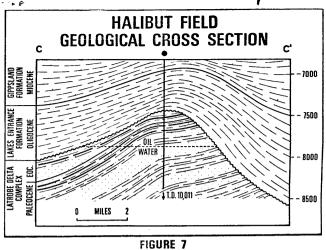
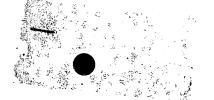


Fig it min is an uncorporate one dead of post. Lower enough of Phisan chamby, the Affect 600' restrict down a course area 117 square mula good oil column of 410 feet a 298 feet of net pay. No gas cap. Oil reservoir consists of locume and Paleour sand bodies.

Case estimate reconvelle prover - probable reserves foil to be about 440 million boards.

Sales Jan 13 × 10 9 auft.

2. Lithology



HALIBUT NO. 1 WELL

2565' - 3020'	Monl light modium grow work silty work
2505 5020.	Marl, light medium grey, very silty, very fossiliferous.
3020' - 4107'	Marl, few stringers of limestone.
4107' - 4597'	
410/ 459/.	Marl, grading to <u>limestone</u> , light grey - light
Legan Lagan	brown, silty, micritic skeletal.
4597' - 4700'	Limestone, as above.
4700' - 4891'	Marl, as above.
4891' - 5500'	Marl with few stringers of limestone.
5500' - 5523'	Core No. 1. Rec. 21'
	Shaly limestone and sandy siltstone with thin
	bands of dark grey calcareous shale.
5523' - 5611'	Marl and limestone.
5 611' - 5800'	Calcareous mudstone, and skeletal limestone.
5611' - 5800' 5800' - 6190'	Calcareous mudstone.
6190' - 6240'	Calcareous mudstone, traces of argillaceous
	siltstone.
6240' - 6250'	Limestone.
6250' - 6971'	Calcareous mudstone.
6975' - 7400'	Calcareous mudstone, pyritic, fossiliferous,
	soft, becoming shaley and firm downwards.
7400' - 7470'	Calcareous shale, grey, green, fairly well
	compacted, sub-fissile, micromicaceous, fine
	carbonaceous flecks, pyritized fossil frag-
	ments.
7440' - 7490'	Shale as above.
7490' - 7500'	75 Coal, black with some quartz grains and
	25 softsilty sandstone. Sandstone, has light
	yellow fluorescence.
7500' - 7510'	50 / Coal.
	10 Fine grained sandstone.
7510' - 7528'	30 5 Coal.
	40 5 Siltstone.
	30 Fine grained sandstone.
7530' - 7550'	Coal, black, brittle and splintery, interbedded
	with carbonaceous shale and dark brown micaceous
	siltstone.
	20 Sandstone, loose quartz grain, fine - very
	coarse, rounded to subrounded. Aggregate
	sandstone, fine grained, well sorted, argill-
	aceous.
7550' - 7573'	Core 2. Rec. 17'
• • • • • • • • • • • • • • • • • • • •	6' Shale bands, interbedded coal.
	11' 0il Sand, dirty, illsorted, argillaceous.
	silty, moderate - low porosity and permability.
	Av. Por. 22 - 23 D.K. 2.5 D.



Core 3. Rec. $5\frac{1}{2}$. 7573! - 7597! Top 2: Sandstone, light brown, poorly sorted, subrounded to angular, clayey matrix, slightly micaceous. Rough bands due to grain size variations. 31: Sandstone with interbedded laminae of carbonaceous shale, sandstone as above. Rec. 20' 7597' - 7623' Core No. 4. Interbedded tight silty sandstone and shale. Core No. 5. Rec. 16' 7623' - 7649' Interbedded tight silty sandstone and shale, grades to well sorted sand at base. Core No. 6. Rec 21'. 7469! - 7673! 12' of Shale (reworked shale). 9' of tight silty sandstone. Core No. 7. Rec. 25' - 25 - 30' Porosity: 7673' - 7706' K = 1840-62,000 M.D.25' Sandstone, massive, medium - coarse, excellent porosity and permeability. Core No. 8. Rec. 30' 7706' - 7733' 13' of previous core. Good sand with some banded silty sandstone. Core No. 9. Rec. 30'. 7738! - 7763! 7' of Sandstone. 23' of Silty sand and interbedded shale. Core No. 10. 7763' - 7790' Core No. 11. Rec. 4'. 77901 - 73201 4' Gravelly and silty sandstone. 78201 Core 13. Rec. 30'. 7852' - 7332' 73521 - 73651 Black Shale. Sandstone, very fine grained, poor porosity 7365' - 7377' and permeability. 7877' - 7332' Shale, sandy in part. Core No. 14. Rec. 18'. 7382' - 7912' 18' recovered 3' of wet sand with good porosity and permeability. Remainder shale with two streaks of coal.

7912' - 7930' Core No. 15. Rec. 5'. 2' of Shale. 3' of Sand. 7930' - 7960' Core No. 16. Rec. 24'. No shale, all sandstone, very fine at top and grades down. Top 11' have clayey, silty matrix. Bottom 13' have good porosity and permeability and no oil. 7960' - 3025' 60' Luartz and 40' Shale. 8020' - 8090' Sandstone, good porosity and permeability. No shows. 8090' - 8160' Shale medium grey. \$160' - 8170' Sandstone. \$170' - 8222' Sandstone. \$222' - 8363' Interbedded sandstone, shale and coal. Minor sandstone. \$363' - 5479' Interbedded sandstone, shale and coal. Minor Sandstone. \$3670' - 9680' Sandstone. \$3680' - 8700' Coal. \$710' - 8800' Sandstone. \$300' - 8310' Coarse gravel quartzose, little pyrites. \$310' - 8860' Sandstone. \$320' - 3330' Coarse gravel san stone, more shaly in last few feet. \$370' - 3330' Coal. \$320' - 303' Very coarse pebbly sandstone. \$350' - 9623' Very coarse pebbly sandstone. \$3630' - 9630' Nostly sandstone, granule - coarse, clear, frosted, no cement, soft white clay about 40'. Ashy appearance, bedded appearance. 955 ' - 9623' Very coarse quartz grains, no cement. \$30' Sandstone, fine grained, tight, cemented with calcarcous material. Prace white clay and some carbonaceous shale. 9630' - 9670' Minor sanistone as above, some white clay and some carbonaceous shale. Shale and sanistone interbedded, medium brown, carbonaceous, silty. Sandstone, no calcareous light grey, fine, argillaceous and cemented.		
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9630' - 9670' Coal, minor sandstone as above, some white clay and some carbonaceous shale. 9670' - 97'0' Shale and sandstone interbedded, medium brown, carbonaceous, silty. Sandstone, non calcareous		minor line grained sandstone, hard, tight,
and some carbonaceous shale. 9670' - 97'i0' Shale and sandstone interbedded, medium brown, carbonaceous, silty. Sandstone, non calcareous	0(201 06701	Cast winer conditions as above some white clay
9670' - 97'i0' Shale and sandstone interbedded, medium brown, carbonaceous, silty. Sandstone, non calcareous	30 30 3070.	and some combonacous shale
carbonaceous, silty. Sandstone, non calcareous	06701 07501	
light grey, fine, argillaceous and cemented.	3070 3740.	carbonaceous silty Sandstone non calcareous.
right grey, rine, argirraccous and committee		light gray fine argillaceous and cemented.
		TTELL CLEAN LTHE, WIETTIMOCOMP WITH DOMONTOCAL

Perforated 7890' - 7894' No flow. Swabbed to 500 feet & got **25** gallons of oil.

3. Core, Mud and Cutting Analysis

CORE, MUD AND CUTTINGS ANALYSIS

FOR

ESSO EXPLORATION AUSTRALIA INC.,

GIPPSLAND SHELF NO. 1 WELL

WILDCAT

VICTORIA, AUSTRALIA

BY

CORE LABORATORIES AUSTRALIA (VIC) LTD.

CORE LABORATORIES AUSTRALIA (VIC.) LTD.

10 mm

Petroleum Reservoir Engineering BRISBANE, AUSTRALIA

G.P.O. BOX 664K CABLE: CORELAB PHONE: 58-1315

31st May, 1965

ESSO EXPLORATION AUSTRALIA INC., BOX 4047, G.P.O., SYDNEY. N.S.W.

ATTENTION: MR. A.A. PHILLIPS.

SUBJECT:

CORE, MUD AND CUTTINGS ANALYSIS

GIPPSLAND SHELF NO. 1 WELL,

WILDCAT,

VICTORIA, AUSTRALIA.

GENTLEMEN:

19 ...

A CORE LABORATORIES AUSTRALIA combination drill cuttings and core analysis unit was present at the site of the subject well during drilling operations from 767 feet to total depth of 8701 feet.

Using standard equipment plus a Programmed Hydrocarbon Detector (rapid sampling gas Chromatograph) the drilling fluid was monitored continuously for hydrocarbon content and the drill cuttings were checked at regular intervals for gas and oil content and lithology. All core analysis was performed by conventional procedures. The results of these operations are shown on the accompanying Grapholog and Coregraph. Core descriptions are shown on the Grapholog.

Hydrocarbon Shows and Core Analysis:

There were no shows of gas or oil from 767 to 3450 feet. From 3450 through 3800 feet we logged high mud gas readings consisting primarily of Methane with some Ethane, Propane, and Butane. Cuttings gas readings were generally low during this interval suggesting a highly permeable reservoir.

From 4800 to 6109 feet samples were generally poor and the gas increases in this interval might be worth further testing if found to be from sand sections. The gas increases from 6550 to 6575 feet and 7825 to 7860 feet appear to be significant and worthy of further investigation. All gas increases from 7860 feet to total depth appear to be of Coal and Siltstones origin.

Good oil fluorescence was only noted in one half foot from $8692\frac{1}{2}$ to 8693. This sample gave an excellent cut in Carbon-tetra chloride however, core analysis indicated low permeability.

We sincerely appreciate the opportunity to have been of service and trust that the information furnished in this report and during drilling operations has assisted the evaluation of this well.

Very truly yours, CORE LABORATORIES AUSTRALIA (VIC) LTD.

JOE B. MC ADAMS,
RESIDENT MANAGER

CORE, MUD AND CUTTINGS ANALYSIS FOR

ESSO STANDARD OIL (AUSTRALIA) LTD.

HALIBUT A-1 WELL (OFFSHORE)

WILDCAT

VICTORIA, AUSTRALIA

BY

CORE LABORATORIES AUSTRALIA (VIC.) LTD.

CORE LABORATORIES AUSTRALIA (VIC) LTD.

Petroleum Reservoir Engineering BRISBANE, AUSTRALIA

28 September, 1967

G.P.O. BOX 664K CABLE: CORELAB PHONE: 58X5X 5-3222

ESSO STANDARD OIL (AUSTRALIA) LTD., G. P. O. Box 4249, SYDNEY, NEW SOUTH WALES. 2001

ATTENTION: MR. JOHN ELLIOTT.

ESSO HALIBUT A-1 WELL,

WILDCAT, VICTORIA.

RE-NAMED SUBJECT: CORE, MUD AND CUTTINGS ANALYSI (AUG. 1968) IALIRU

GENTLEMEN:

A CORE LABORATORIES AUSTRALIA combination drill cuttings and core analysis unit was present at the site of the subject well during drilling operations from 800 Feet to the total depth of 10,011 feet.

Utilising standard equipment plus a Programmed Hydrocarbon Detector (Sampling Gas Chromatograph), and a Beckman GC-1 Gas Chromatograph (H₂S and CO₂ Detector), the drilling fluid was monitored continuously and the drill cuttings were checked at regular intervals for gas and oil content and lithology. In addition, a Shale Density kit was utilised to determine density of shale and similar sediments. All core analysis was performed by conventional procedures. The results of these operations are shown on the accompanying Grapholog and Coregraph.

Hydrocarbon Shows. Local increases in Methane and Carbon dioxide were recorded in the higher sections of the well.

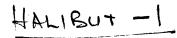
A major hydrocarbon zone was first encountered between 7,490' and 7,500', and extended to 7,960°. Heavy hydrocarbons up to C4 were encountered in the higher portions of the zone, but were of relatively low concentrations. Good yellow-blue fluorescence was observed in the sand portions of the zone to 7,917'. An immediate streaming cut was obtained throughout the entire portion of the zone exhibiting fluorescence. As a matter of interest, a heavy hydrocarbon C2 was observed in conjunction with a coal seam at 9,870'. No other coal seams were found to have hydrocarbons other than Methane.

Core Analysis of the zone 7,550' to 7,954' indicated satisfactory reservoir conditions, with a reasonably good oil saturation. Exceptionally high permeability measurements in Core No. 16 (7,390' - 7,960') are thought to be unrepresentative of reservoir conditions, as the sand in this high permeability area was extremely friable.

We sincerely appreciate the opportunity to have been of service, and trust that the information furnished in this report and during drilling operations has assisted in the evaluation of this well.

Ke cewed at Lusse ee St 20 Get Yours very truly, CORE JABORATORIES AUSTRALIA (VIC) LTD.

ACTING MANAGER.



CORE LABORATORIES. INC.
Petroleum Reservoir Engineering
OALLAS. TEXAS

FIEHULIBUT V Rage 1 04 14

CORE ANALYSIS RESULTS

C	ESSO STAN	DARD OIL .	F	ormation			File		
Company Well	HALIBUT &		C	ore Type_		AMOND	Date Repo		LY 67
Field	WILDCAT		D	rilling Flu	id FRE	SH WATER GEL	Analysts	TM RS	
0200 TEL	AUST.	State VIC.	_Elev_3	1'KB I	ocation			· · · · · · · · · · · · · · · · · · ·	
SANO SD SHALE-SH LIME-LM	DOLOMITE - DOL CHERT - GH	ANHYDRITE - ANHY CONGLOMERATE - CONG. FOSSILIFEROUS - FOSS	Litho	r MEDI		CRYSTALLINE-XLN BROWN GRAIN-GRN GRAY- GRANULAR-GRNL VUGGY	LAMINA	TION - LAH	ELIGHTLY SL/ VERY V/ WITH W/
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	PER CENT	PER CEN			SAMPLE DESCRIP		
COR	RE No.2 CUT	7550 -7578	REC.	17					
	7550	290	11.5	14.8	63.5	LY BRN, FR-WI	ED GRN.		
2	7552		24.5	15.5	55.5			GRN, SUE	RND
3	7554 ×	1695	23.8	9.2	60.9	CLAY MATRIX	H H		
4	7555 X	5700	24.8	16.9	45.6	and the second	H H		
5	7557 66.	116	17.6	10.2	50.8	n , , , , , , , , , , , , , , , , , , ,	n n	15	# // ·
6	7559 68	2490	24.0	7.9	52,1	Ħ Ħ	H H	n	# 1
7	7561 70	610	24.9	9.0	55.0	W/MORE F		AND CL	AY)
8	7563 12	2562	22.8	17.5	48.2	SS LT GY-LT			
9	7565,74	1728	22.6	11.7	48,8	SS MED GY-B	EN, MED GI	RN SUB	RND.
10	7567 76	2462	21.3	8.5	57.7	SS MED GY-8		CRSE GR	N,

NOTE - SAMPLE No.1 DEVELOPED FRACTURES IN SHALE WHILE DRYING, GIVING HIGH SHALE PERMEABILITY.

SAMPLE No.2 PERMEABILITY SAMPLE BROKE UP DURING PERMEABILITY TEST.

CL-511-1

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		3.1				File		3
Compar		NDARD OIL		rmation	MOND			JULY67
Well	HALIGUT	A-1	C					RS
Field	. WILDCAT		D	rilling Fluid FRE	ON WALLIA	***	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Christ.	AUST.	StateVIC.		KB Location				
SAND SE SHALE-SH	DOLOMITE DOL GHERT CH	ANHYDRITE ANHY CONGLOMERATE CONG FOSSILIFEROUS FOSS	Litho		ONS CRYSTALLINE XLN GRAIN GRN GRANULAR GRNL	BROWN BRN GRAY - GY, VUGQY - VGY	FRACTURED FRAC LAMINATION LAM STYLOLITIC-STY	SEIGHTLY-SE/ VERY-Y/ WITH-W/
LIME . LM	CYPSUM.GYR	PERMEABILITY	POROSITY	RESIDUAL SATURATION PER CENT PORE			DESCRIPTION	
LUMBER	FEET	MILLIDARCYS	PER CENT	OIL TOTAL WATER				
C	ORE No.3 CU	rt 7578'-759'	7' REC.	6.				
	7579	14.2	23.8	16.8 57.6	SS.LT-ME	D BRN, ME	D-CRSE GR	
12	7580	506	24.6	13.8 49.3	<u>SS</u> "			
13.	7581	313	27.1	14.0 48.3	<u>ss</u> "			
14	7582	260		14.2 49.8			it i	
15	7503	43.4	*24.4	16.8 55.7	SS LT-#	ed brn, fr	I-MED GRN,	SILTY
16	7584	20.0	24.7	14.2 54.6	<u>88</u> "	" " F	e GRN, SIL	1 Y •

CORE LABORATORIES. INC. Petroleum Reservoir Engineering

DALLAS, TEXAS

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CORE ANALYSIS RESULTS

W'ell	HALIBUT WILDCAT	ANDARD OIL A-1 State VIC.	Cor Dr	e Type Illing Fla	DIAM and FRES	MOND Sh wate	R GEL _	Date Report Analysts	21 JULY 67 M RS ES
SANT SO SHAUE SH LIME LM	EUJOMITE DOL CHER*-JH GYPSUM GYP	ANHYDRITE ANHY CONGLOMERATE.CONG FOSSILIFEROUS FOSS	Lithol SANDY SUV SHALV SHY	FINE MED: COAF	Abbreviai	IONS CHYSTALLINE GHAIN GHN GRANULAF G	GRAY G	Y LAMINATIO	N LAM VERY-V/
SAMPLE NUMBER	DEPTH	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	PER CEN	ATURATION IT PORE TOTAL WATER			SAMPLE DESCRIPTION AND REMARKS	DN
		CORE	NO.4 7	597 '-	7623'	REC.	18'		
1	7598	21.6	18.05	13	47.3	SS	LT-WED	GY, FN GRN	,SILTY.
1 2	7601	139.5		12.7	47.2	SS	11	11	11
19	7602	2233.0	18.1	13.3	46.4	SS.	Ħ	t1	ff .
20	7603	2178.0	20.3	11.2	47.1	SS	18	ti	11
21	7604	31.3	20.3	15.1	45.2	SS	11	·. #	11
22	7605	61.8	20.7	15.0	45.8	SS	11	ff	†1
23	7606	172.6	22.8	17.1	43.8	SS	11	11	
24	7609	* 425.0	7.3	0.0	89.0	-SS	\ tt	. P f	"V SHALY
25	7613	125.0	21.8	16.5	46.8	SS	11	11	ff
26	7616	541.0	15.6	9.0	48.1	SS	Ħ	11	<u></u>

*FRACTURED .

The second section with the second section in the second section in the second section section is a second section of the second section secti

CORE LABORATORIES, INC. Petroleum Reschor Engineering DALLAS, TEXAS

CORE ANALYSIS RESULTS

Compus Well Field &&&&	ESSO ST HALIBUT WIEDCAT AUST.	ANDARD OIL A-1 State VIC	m a 1 125	DIAMOND FRESH WATER G	File Date Report 22 JULY 67 SEL Analysis TM RS ES
·	SOLOMITE DOS	ANHYDRITE ANHY	Lithological A	N CHYSTALL NE XLN	BROWN BEN FRACTURE. FPA: 4. GHILT SE/
SHA E SH	CHERT CH GERSUM GYP	CONGLOMERATE CONG	SHALY SHY MEDIC LIMY EMY COARD		GRAY GN GAMINATION TEN GENTLY LUGGY VGV STYLOLIT C STY WITH W
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	RESIDUAL SA POROSITY PER CENT PER CENT OIL		SAMPLE DESCRIPTION AND REMARKS
		COR	E No. 5 7623	7648' REC. 16'	
27	7623 ⁻	268.0	17.8 6.2	58.2 SS LT-MED	GY, FN GRN, SILTY.
	7625·	132.6	19.1 11.5	54.0 SS "	rt tt
29	7627	2.1	16.2 11.7	53.1 SS LT-MED	GY, FN GRN, SILTY, PYRITIC.
30	7631	1.9	18.0 10.5	60.0 SSAS ABOVI	W/SH LAMINATIONS
31	7636	10.1	11.0 7.3	61.0 SS MED-DK	GY, MED-CRSE GRN, SILTY.
32 32	7637-	*4023.0	22.8 5.7		CRSE, FRIABLE, PYR.
33	7639	120.4	22.1 8.1	56.6 SS "	11 11

^{*}FLUSHED AND CONTAMINATED WITH DRILLING MUD.

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Petroleum Reservoir Engineering DALLAS, TEXAS

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CORE ANALYSIS RESULTS

Company Well Field *XXXV	HAL IBUT WILDCAT	NDARD OIL A-1 A State VIC.	Formation Core Type Drilling Flu Flev 31 KB	id, FRES	QND Date Report 22 JULY, 67 H WATER GEL Analysts RS TM ES
SAND SD SHALE-SH LIME-EM	DOLOMITE - DOL CHERT - CH GYPSUM - GYP	ANHYDRITE - ANHY CONGLOMERATE - CONG FOSSILIFEROUS - FOSS		FN (ORS RYSTALLINE-XLN BROWN-BRN FRACTURED FRAC SCIGHTLY-SL/ IMAIN GRN GRAY-GY LAMINATION LAM YERY-V/ GRANULAR GRNL VUGGY-VGY STYLOLITIC STY WITH-W/
SAMPLE	DEPTH	PERMEABILITY MILLIDARCYS	POROSITY PER CEN		SAMPLE DESCRIPTION AND REMARKS
a manual service of the service of t		CORE NO	.6 764917678	3' REC.	21'
34	7649	0.60	11.5 5.2	80	SS, DK GY V/CSE-FN GRN SHALY
35	7660 *	3102.7	16 6.9	71.4	SS & BRN-GY CSE TO FN GRN SILTY
36	7661	5.7	10.9 10.1	72.5	SS, DK GY CSE SILTY
37	7663	6.3	15.3 5.9	79.2	SS, DK GY V/CSE TO FN
38	7665	14.0	8.5 10.6	73	SS, DK GY GSE TO FN SILTY
39	7667	805.4	17.2 9.3	53.5	SS, DK GY V/CSE TO FN FRIABLE
40	7669	780.6	28.1 10.7	40.5	SS, BRN GY MED TO FN GRN FRIABLE

FRACTURED PERM PLUG , ASNORMALLY HIGH READING.

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and the state of the

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Company Well Fleid XXXX	, ESSO ST HALTEUT WILDCAT AUST.			ormation ore Type brilling El		DIAMO FRESH	NO WATER		e Report 23 dvs/s TM	JUL RS	Y 67 ES
Anaraya				ological	X bbrevia	ations					•
SMALE SH	A Commence of the Commence of	Karana da kacamatan kacamatan kacamatan kacamatan kacamatan kacamatan kacamatan kacamatan kacamatan kacamatan Karana da kacamatan	n de Paris III (no. Ne paris de la III (no. Ne paris III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III) (no. III (no. III (no. III (no. III (no. III (no. III (no. III)			GRATTLE G	, v N	GRAN GN VUGGI VGY	FRACTURE: FRAC LAMINATION . 4M STRUCTURE STY	· w	GHTLY SE/
NUMBER	DEPTH	PERMEAU, CITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL S PER CEN OIL		• 		SAMPLE	DESCRIPTION REMARKS		
	•	CORE No.7	7678'-	7706	, RE C	. 25'					
47	7679	1842	28.3	11.7	43.8	SS	LT-MED	GY-BRN	, FN-MED	GRN,	FRIABL
42	7680	1720	25.1	13.5	57.0	·ss	11	- 11	f P	11	19
43	7681	2455	26.8	14.0	54.0	SS	n	ft	**	Ħ	Ħ
44" 9	7682	2605	27.7	14.1	50.2	SS	11	17	·tt	17	R
45	7684	5515	29.2	12.7	53.1	SS	11	fi	Ħ	11	at .
÷6	7687	2717	25.7	11.5	44.6	SS	11	75	Ħ	tī	17 .
4.7	7689	4210	28.4	14.8	57.6	SS	11	98	ŧţ	71	\$1
-}8	7691	4210	28.8	13.0	60.5	SS	rı	n	π	**	11
49	7693	4023	29.1	15.5	54.0	SS	***	TI .	, n	f †	ξŧ
50	7695	5363	27,0	15.4	55.6	SS	n ti	11	f1 ·	n	19
51	7697	5515	26.9	12.6	57.6	SS	f †	F7	*1	n	**
5.	7699	6240	28.0	14.8	52.0	SS	••	11	ts.	म	Ħ
53	7700	2605	28.6	12.9	57.0	38	24	11	71	**	n
54	7702	5868	29.2	12.7	45.9	SS	PT	n	n	11	f1
55	7703	4023	27.4	14.4	59.2	SS	n	11	Ħ	11	11



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CORE ANALYSIS RESULTS

Well	HAL IBUT WILDCAT	NDARD OIL A-1 State VIC.	Formation Core Type DIA Drilling Fluid FRE Elev. 31 KB Location	SH WATER	Dat	e Report 24 alysts RS	
			Lithological Abbrevia	tions			
BANG SD Bhale Bh Lime Lm	DOLOMITE DÖL Chertich Gypbumigyp	ANHYDRITE ANHY Conglomerate Cong Possiliperous Poss	SANDY SDY FINE FN SHALY SHY MEDIUM MED LIMY LMY COARSE CSE	CRYSTALLINE - XLN Grain - Grn Granular - Grnl	BROWN - BRN GRAY - GY VUGGY - VGY	FRACTURED FRAC LAMINATION LAM STYLOLITIC STY	SLIGHTLY-SL/ VERY-V/ WITH-W/
MPLE MBER	DEPTH PEET	PERMEABILITY Millidarcys	POROSITY RESIDUAL SATURATION PER CENT PORE PEH CENT OIL TOTAL WATER			DESCRIPTION REMARKS	

							·		
		CORE NO.8	7706'-	7733'	REC. 3	50 °		ı	
56	7706	*	28.9	14.2	49.5	SS , BR	N-GY MED C	OARSE GRN	
57	77 07	*	24.8	16.5	58.5	ff 17	**	n	
58	7708	*	28.8	16.5	55.0	11			4.
59	7709	5868	25.2	13.5	55.5	11	Ħ	11	
60	7711	*	25.0	13.2	51.6	n ·	98	n	
61 (7712	* .	25.8	14.7	50.3	10	Ħ	Ħ	
62	7713	*	28.0	16.4	55.7	11	**	**	
63	77.14	1805	24.9	12.1	53.1	11	77	n	
64	77 18	3277	29.2	17.4	54.2	11	ff	77	
65	7719	*	26.1	14.5	55.2	11	. #	n n	•
66	7721	*	27.6	16.3	55.1	***	19	" .	
68	7722	1105	19.8	16.1	53.0	SS, GY	FN-WED GR	N	
68	7724	5 868	25.1	19.1	48.6	SS, GY	MED CRSE	GRN	
69	7725	328	20.0	12.0	54.5	SS, GY	FN-GRN, S	HALY	
70	7727	147.5	25.5	10.6	44.3	SS, GY	MED CRSE		
71	7728	. 13.9	14.9	6.7	49.7	SS, GY	MED CRSE,	SHALY"	
72	7729	177.1	22.9	13.6	48.4	SS, cy	FN-MED GR	N .	
73	7733	7.4	23.6	14.0	49.6	SS, GY	FN-MED GR	N, SHALY	

*SAMPLES TOO FRIABLE FOR PERMEABILITY MEASUREMENT"

ALL SAMPLES SHOWING GOOD NOTE. ODOR AND FLUORESCENCE.

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CORE ANALYSIS RESULTS

Copapar	ESSO ST	ANDARD OIL		Formation				File			
Well_		A-1		Core Type	DIAMO	DND		Date F	Report 24	JULY,	67_
F:eld	WILDCAT	apparent for the second	I	Orilling Flui	d_ERESI	H. WATER	GEL	Analys	ts_TM_E	<u>s Rs</u>	
n de la	AUST	StateVIC	Elev.	31_KB_L	ocation		 				
SANO SO SHALE SH LIME LIM	DOLOMITE - DOL CHERT - CH GYPSUM - GYP	ANHYDRITE - ANHY CONGLOMERATE - CONG FOSSIL FEROUS - FOSS	Lith	Y MEDIU	FN CR M.MED GR	NS YSTALLINE XLN AIN GRN ANULAR GRNL	BROWN - BRN GRAY - GY VUQGY - VGY	L	RACTURED - FRAC MINATION - LAN TYLOLITIC - STY		/ /
SAMPLE .	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	PER CENT			SĄ	MPLE DES	SCRIPTION		
•	7734	CORE NO. 9	7733 25.6	'- 7763 15.2	! RI	EC. 30'	GY-BRN	MED	TO CRS	E GRN	HIC
75	7735	82.6	19.8	9.6	45.7	SS,LT	MID GY	MED	GRN CA	RE STR	REAK
76	7736	1010	23.6	14.8	50.4	SS, LT	HID GY	FN T	O MED	GRN	
77	7737	1510	25.9	12.7	47.2	SS,"	H H	PF	79 FF	F# .	٠.,
78	7738	1180	26.4	15.5	44	SS,"		Ħ	tt ti	11	
79	7745	3.6	18.9	7.4	60.9	SS,MID	GY FN	GRN	SILTY		
80	7 755	1.3	16.2	8.7	59.9	SS, "	fi fi	71	Ħ	SHALY	

NOTE: WAXY RESIDUE IN RETORT SAMPLES 79 & 80

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			,		•	•
Compa	ESSO ST	ANDARD OIL	Formation	•	File	
Compai Weli_	HAL IBUT		Core Type	DIAMOND	Date Report 2	5 JULY 67
Fleld	WILDCAT		Drilling Fluid	FRESH WATER	GEL Analysts RS	
County.	AUCT	State VIC.	Elev. 31 KB Loca			
-4-0 50 3-4-18-9h	DOLOMITE DOL	ANHYDRITE - ANHY CONGLOMERATE - CONG FOSSILIFEROUS - POSS	Lithological Abb	reviations CRYSTALLINE XLN MED GRAIN GRN	BROWN BRN FRACTURED FR GRAY-GY LAMINATION L VUGGY-VGY STYLOLITIC S	AM VERY V
SAMPLE NUMBER	, DEPTH .	PERMEASILITY MILLIDARCYS			SAMPLE DESCRIPTION AND REMARKS	
	:	CORE NO.10	7763'-7790' R	EC.23'		
		· ·				
81	7777	0.6	11.2 9.8 7	1.4 SS FN-	V CRSE, SHALY.	
82	7780	1730.0	24.3 15.6 5	4.3 SS BRN	-BUFF, WED-CRSE.	
83	7781	1290.0		4.2 SS	# II	
84	7783	5870.0	- · · · · · · · · · · · · · · · · · · ·	5.3 SS	tt it	•
85	7784	2610.0		1.2 SS	п	
86 86	7785	1110.0		3.1 SS	'h	
37	7786	1520.0			MED GR.	

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CORE ANALYSIS RESULTS

W'ell. Field.	HALIBUT WILDCAT		(1	Core Type . Drilling Flo	DIAM	OND SH_WAT		Date		
(XXX).	AUST	State_VIC.	Elev. 3	1'KB I	Location_					
			Lith	ological A	bbrevia	tions				
SAN. SO SHALE SM SIMESOM	HO OM TE DOL Chertigh Gypsum Gyp	ANHYDRITE ANHY . CONGLOMERATE CONG FOSSILIFEROUS FOSS	SANDY SE SHALY SH LIMY LMY	Y MED	FN UM MED SE-CSE	CRYSTALLINE GRAIN - GRN GRANULAR - G	, GR	AY - GY	FRACTURED FRE LAMINATION - L. STYLOLITIC - ST	AM VERY-V/
SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY	OIL	T PORE TOTAL WATER			. AND R	ESCRIPTION EMARKS	
			CORE	NO. 11	. 7790) '- 7820) REC	· 4½ 1		
ε •	7790	3650.0	23.4	12.8	43.6	ss,	BUFF,	CRSE-V	CRSE,	FRIABLE
89	7791	4410.0	21.1	16.7	57.8	. #		9 9	ŧŧ	Ħ
90	7792	5960.0	18.6	10.2	47.9	19		17 ·	79	ę:
91	7794	3060.0	23.6	15.3	49.6	Ħ		11	£\$	Ħ.

NOTE: ALL SAMPLES SHOWING GOOD ODOR AND FLUORESCENCE.

Petroleum Rescreoir Engineering DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company Well Field (XXX) .	ESSO STA HALIBUT WILDCAT AUST.	A-1 State VIC	, Co	ormation ore Type rilling Flu !KBL	DIA FRE	AMOND ESH WAT	ER GEL		e Report, 2	8 JULY	67_
SHALE SHELLER	COLUMN TE DOS CHEST OF GENERAL GEN CHEST FE ELET	ENGYORITE AND CONGLOWERATE CONG FOSS LIFEROUS FOSS PERMEABILITY MILL, DARCYS	Litho	FINE	UM MED ISE CSE ATURATION	ORS CHYSTAULINE A GRAIN GEN GRANULAH GEN	GRAY - GY	SAMPLE	FRACTURED FILL LAMINATION STYLOLITIC STYLOLITIC STYLOLITIC STYLOLITIC STYLOLITIC STYLOLITICS STATEMENT STYLOLITICS STATEMENT STYLOLITICS STATEMENT STATEMENT STATEMENT STATEMENT STATEMENT STATEMENT STATEMENT STATEMENT STA	LAM VE4	HTLY .S./ V.V/ H.W/
		CORE	vO. 13	7852	'- 7882	REC.	30'				
92	7864	3.3	11.2	6.3	68.7	SS,	GY, FN	GRN	, SHY,	FAIR (DOR
93	7865	1543.0	17.5	10.9	58.4	ft .	" FN-	- C S E	9	GOOD	DOR
94	7867	2.5	8.7	13.8	76.0	19	DK GY,	FN	, SHY,	POOR	0 0 0 R
95	7868	<0.1	14.4	5.5	70.8	n	> #f	11	v/sн y	11	
96	7869	0.7	13.3	1.5	65.8	11	N	17	11	11	_
97	7870	*156.0	8,8	2.9	60.9	11	fI	tı	11	11	
98	7871	35.0	25.6	16.8	57.4	11	LT GY	#	CLEAN	, 6000	ODOR
ga_	7872	420.0	26.2	17.2	60.3	11	n ·	Ħ	ŧί	Ħ	
100	7873	101.0	24.4	16.8	50.0	11	. #	11	tt	11	
101	7874	16.0	23.8	16.8	42.8	. 19	n	11	Ħ	11	
₹02	7875	24.0	22.9	15.3	50.2	51	n	11	SHY	**	
103	7878	1.0	16.8	3.6	73.2	. 11	G Y	#1	п	POOR	ODOR
104	7 88 0	.2	15.0	7.4	70.0	$\mathbf{u}_{ _{V}}$	Ħ	n	11	11	

*FRACTURES IN PERMEABILITY PLUG

CORE LABORATORIES, INC.

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Company	ESSO STA	NDARD OIL	Fo	rmation				File	1111 V CB
W'ell	HALIBUT	A-1	Co	re Type	DIAMO	ND		Date Report_29	JULY 67
Sield	WILDCAT		Dr	filling Flu	id FRE	SH WALL	R GE	EL Analysts RLS	S
_*XXX	AUST	State VIC.	_Elev. 31	'KB I	ocation				
•			Litho	logical A	bbrevia	tions		DOWN RRN FRACTURED FRAC	SLIGHTLY·SL/
SANC SO BHACE SH CIME CM	DOLOM TE DOL CHERTICH GYPSUMIGYP	ANHYDRITE ANHY CONGLOMERATE CONG FOSSILIFEROUS - FOSS	SANDY - SUY SHALY - SHY LIMY - LMY		FN UM - MED SE - CSE	GRAIN GRN GRANULAN GRN	c	ROWN BRN FRACTURED FRAC BRAY GY LAMINATION LAM UGGY VGY STYLOLITIC STY	VERY-V/ WITH-W/
NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	PER CEN				SAMPLE DESCRIPTION AND REMARKS	
		CORE NO). 14	7882	·-7912	rec.	18	1	•
105	7883	127.0	15.7	6.4	61.2	SS,	GY,	V/FN-V/CSE,	GOOD ODOR
106	7886	1.3	15.2	7.2	78.3	11	et	V/FN, SHY,	POOR ODOR
107	7890	,2	14.7	1.4	74.4	и.	11	15 39	17
108	7891	289.0	15.0	9.3	47.3	Ħ	11	MED GRN,	GOOD ODOR
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Petroleum Reservoir Engineering
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Page No. 13

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^{*} TOOFRIABLE FOR PERMEABILITY MEASUREMENT.

NOTE: VERY SOFT SAND IS EASILY MOULDED BY HAND. UNUSUALLY HIGH PERMEABILITY WALUES PROBABLY DO NOT EXIST IN RESERVOIR.

4. Palynological Report.

PALYHOLOGICAL REPORT ON HALIBUT A-1 WELL, 8400 - 9000 FEET

Further to the palyhological study (Dettmann 1987) carried out on core and cutting samples from between 7859 feet and 8300 feet in Esso Halibut A-1 well, cuttings from 8400 - 9000 feet have been examined palyhologically and the results are assessed in this report. The material examined from between 8400 feet and 9000 feet yielded generally poorly preserved plant microfossils including infrequent spores, pollen grains, and microplankton and abundant wood and cuticular debris.

1) 8400 fest - 8600 feet

Spores, pollen grains, and microplankton extracted from the naterial examined contain pyritic material adherent to and/or embedded in the wall layers. The plant microfessils are accompanied by foraminiferal remains consisting of inner chitinous tests arranged in planispiral whorls of up to 15 chambers. Spore-pollen species identified include Triorites edwardsii, Dacrydiumites balmei, and Stephanoreroscollenites obscurus. The presence of these forms and the absence of species restricted to the Cretaceous suggests that the horizons are referable to the Triorites edwardsii or Transition Zones.

Microplankton entracted from the samples are numerically insubordinate to spores and pollen grains except in a sample from 8400 feet where hystrichosphaerid types are common. Microplankton species identified include <u>Ginginodinium tabulatum</u>, <u>Cyclonephelium retiintentum</u>, and diverse forms possibly referable to <u>Baltisphaeridium</u>.

2) 8700 fest - 9000 feet

The impoverished microfloras entracted from the samples are poorly preserved and consist chiefly of spores and pollen grains. Microplankton



7

Were fectivered in minor proportions from several samples and include Cyclomethelium retiintextum and Baltisthaeridium spp. Spore-pollen species identified include Dacrydiumites balmei, Stephanoporopollenites obscurus, and Nothofagidites emarcidus. Forms diagnostic of the Tricolpites lillei Zone or older Cretaceous zones were not recognized and the presence of Dacrydiumites balmei may suggest that the sediments are within the Triorites edwardsii or Transition Zones.

CONCLUSIONS

Sediments between 3400 feet and 9000 feet in Halibut A-1 well are considered on the basis of their contained microfloras to be possibly within the <u>Triorites edwardsii</u> or Transition Zones. The <u>Triorites edwardsii</u> Zone probably extends as high as 7650 feet (Dettmann 1967) and is succeeded by the <u>Duplopollis</u> orthoteichus Zone (7559 - 7629 feet).

Palymological contents of the <u>D. orthotochus</u> Zone include dominant spores and pollen grains and rare microplankton. In the <u>T. edwardsii</u> and/or Transition Zones spores and pollen grains are dominant in the majority of samples, but microplankton show a qualitative increase in samples between 8400 feet and 3600 feet where they are associated with foraminiferal remains. Similar associations of abundant microplankton, infrequent spores and pollen grains, and foraminiferal remains have been recorded from the <u>T. edwardsii</u> Zone in Kingfish A-1 cell (Dettmann 1963).

REFELENCES

Dettmenn, M.E. 1987. Palymological report on Esso Halibut A-1 well, 7559 - 8600 feet, Unpubl. report submitted to Esso Standard Cil (Australia) Ltd. 2/15/87.

Dettnamm, M.E. 1988. Palymological report on Esso Mingfish A-1, B-1, and C-1 wells. Unpubl. report submitted to Esso Standard Cil (Australia) Ltd. 30/8/88.

6th December, 1968

Mary E. Dettmann, Department of Geology, University of Queensland, Qld.



PE904840

This is an enclosure indicator page.
The enclosure PE904840 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904840 has the following characteristics: ITEM_BARCODE = PE904840 CONTAINER_BARCODE = PE904839 NAME = Halibut 1 Species List

NAME = Halibut 1 Species Lis BASIN = GIPPSLAND

PERMIT = VIC/L5 TYPE = WELL SUBTYPE = DIAGRAM

DESCRIPTION = Halibut 1 Species List

REMARKS = Page 1 of 4

DATE_CREATED = DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR =

CLIENT_OP_CO = Esso Australia

(Inserted by DNRE - Vic Govt Mines Dept)

This is an enclosure indicator page.

The enclosure PE904841 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904841 has the following characteristics:

ITEM_BARCODE = PE904841
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Species List

BASIN = GIPPSLAND

PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = DIAGRAM

DESCRIPTION = Halibut 1 Species List

REMARKS = Page 2 of 4

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR =

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page. The enclosure PE904842 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904842 has the following characteristics:

ITEM_BARCODE = PE904842
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Species List

BASIN = GIPPSLAND

PERMIT = VIC/L5 TYPE = WELL

SUBTYPE = DIAGRAM

DESCRIPTION = Halibut 1 Species List

REMARKS = Page 3 of 4

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR =

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page. The enclosure PE904843 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904843 has the following characteristics:

ITEM_BARCODE = PE904843
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Species List

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = DIAGRAM

DESCRIPTION = Halibut 1 Species List

REMARKS = Page 4 of 4

DATE_CREATED =

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WELL_NAME = Halibut-1

CONTRACTOR =

CLIENT_OP_CO = Esso Australia

DATE 19 April 1971

ELEV. 431

WELL NAME HALIBUT -/

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COMMENTS	
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Note: If highest or lowest data is a 3 or 4, then an alternate 0, 1, 2 highest or lowest data will be filled in if control is available.

If a sample cannot be interpreted to be one zenule, as spart from the other, no entry should be made.

- 0 SWC or Core Complete assemblage (very high confidence).
- 1 SWC or Core Almost complete assemblage (high confidence).
- 2 SWC or Core Close to zonule change but able to interpret (low confidence).
- 3 Cuttings Complete assemblage (low confidence).
- 4 Cuttings Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

Uair <i>n</i>	BOVERSO PROCESSOR A CONTRACTOR PROCESSOR
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WELL NAME HALIBUT -/

ELEVATION

+31 FEET

		HI	GHEST	DATA			LOW	EST I	DATA		
AGE	PALYNOLOGIC ZONES	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
IO.	P. tuberculatus										
-	U. N. asperus										
	M. N. asperus										
	L. N. asperus								-		
NE	P. asperopolus		•								
EOCENE	U. M. diversus										
	M, <u>M</u> , <u>diversus</u>										
	L. M. diversus	7550	1				7632	1	1		
CENE	U. L. balmei	7650	1				793/	1			
CE	L. <u>L</u> . <u>balmei</u>	9360	/				9560	1			
721	T. longus	9721	2				9860	2			
	T. lilliei								77777		
SOOS	N. senectus										
CRELLLEOUS	C. trip./T.pach										
CR.	C. distocarin.										
	T. pannosus			·							,
EA	RLY CRETACEOUS										•
PR	E-CRETACEOUS										
	<i>T.D.</i>	10,010									

COMMENTS:

Wetzeliella homomorpha Dinoflagellate Zone 7650(1) - 7915(1)
The Eisenackia crassitabulata Dino. Zone may be present in the unsampled interval between 7931' to 9360'. The basal part of the L.L. balmei Zone and the top of the T. longus Zone contain dinoflagellates but lack the zone species of the T. evittii / D. druggii Zone

RATINGS:

FORM No R 315 12/72

- 0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
- 1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
- 2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
- 3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spore and pollen or microplankton, or both.
- 4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATA RECORDED BY: LES.	DATE_Dec. 1971.
DATA REVISED BY: A.D.P.	DATE Jan. 1975.

DATE

HALIBUT -1

REPRESENTATION

7 31 feet

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If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence cating, so alternate depth with a better confidence rating should be entered, if possible

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5. Hydrocarbon Report. * F.I.T. data.

FILE COPY

PRODUCTION RESEARCH COMPANY

POST OFFICE BOX 2189 - HOUSTON, TEXAS 77001

RESERVOIR DIVISION
C C MATTAX
MANAGER

July 10, 1978

Mr. J. F. Kirk Esso Australia Ltd. G. P. O. Box 4047 Sydney, N.S.W., 2001 Australia

Attention: Mr. C. A. Langner

Dear Sir:

EPR.75PS.78 - Hydrocarbon Report
Analysis of Metered Liquid Stream Samples
Halibut, Kingfish A and Kingfish B Platforms
Longford Plant Stabilizer
Esso Australia Ltd.

This report presents results of PVT and compositional analyses made on the above mentioned samples. Also included are the results of flash liberation experiments made on the three platform samples which contained gas in solution. This work was undertaken to obtain data relating volumes at metered conditions to volumes at standard conditions and was initiated by Mr. D. A. Collins' telex of January 24, 1978.

Very truly yours,

C. C. MATTAX

By Robert H. Rossen R. H. Rossen

GTP:clw

cc: E. C. Wells, Jr.

EXXON PRODUCTION RESEARCH COMPANY

HYDROCARBON REPORT - METERED LIQUID STREAM SAMPLES HALIBUT, KINGFISH A AND KINGFISH B PLATFORMS LONGFORD PLANT STABILIZER

PRODUCTION LIBRARY

G. T. Pyndus W. T. Muzacz

R. W. Myers

Reservoir Division

June 1978

EPR.75PS.78

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HALIBUT PLATFORM METERED LIQUID

TABLE I

Pressure-Volume Relations of Metered Liquid Sample

Source: Esso Australia Ltd., Halibut Platform Metered Crude

Date Taken: March 16, 1978

Sampling Conditions: 600 psig and 198°F

Pressure, psig	Relative Volume @ 198°F	Density, gm/cc @ 198°F
1000 903 807 713 600 508 317 P _b = 230	0.9919 0.9931 0.9944 0.9956 0.9968 0.9981 0.9987 1.0000	0.7557 0.7548 0.7538 0.7529 0.7520 0.7510 0.7506 0.7496
Volume @ 14.73 psia & 6 Volume @ 14.73 psia & 1	0°F 98°F 0.7510*	
gm/cc @ 14.73 psia & 60	°F	0.8064*
Volume @ 14.73 psia & 6 Volume @ 600 psig & 198	0°F 0.9102*	

Specific volume at saturation pressure = 0.02147 cu ft/lb

^{*}Based on residual liquid from an atmospheric flash liberation @ 77°F having a density of 43.6° API @ 60°F.

TABLE II

Hydrocarbon Analysis of Metered Liquid Sample

Source:

Esso Australia Ltd., Halibut Metered Liquid

Date Taken:

March 16, 1978

Nitrogen 0.03 0.16 Methane 0.34 3.00 Ethane 0.32 1.59 Propane 1.19 3.94 Iso-Butane 1.16 2.97 N-Butane 1.68 3.39 N-Pentane 1.87 3.78 Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67	Component	Weight Percent	Density, g/cc at 60° F	Molecular _Weight	Mo1
Methane 0.34 3.09 Ethane 0.32 1.59 Propane 1.19 3.94 Iso-Butane 1.16 2.97 N-Butane 1.68 3.39 N-Pentane 1.68 3.39 N-Pentane 1.87 3.78 Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.78 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67	Carbon Dioxide			·	Nil 0.76
Ethane 0.32 1.59 Propane 1.19 3.94 Iso-Butane 1.16 2.97 N-Butane 1.68 3.33 N-Pentane 1.87 3.78 Hexanes 2.97 0.6911 85 5.00 Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					0.16
Propane 1.19 Iso-Butane 1.16 N-Butane 1.79 Iso-Pentane 1.68 N-Pentane 1.87 Hexanes 2.97 0.6911 Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					3.09
Iso-Butane 1.16 2.9 N-Butane 1.79 4.49 Iso-Pentane 1.68 3.39 N-Pentane 1.87 3.78 Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					1.55
N-Butane 1.79 4.49 Iso-Pentane 1.68 3.39 N-Pentane 1.87 3.78 Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.79 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					3.94
Iso-Pentane 1.68 3.39 N-Pentane 1.87 3.78 Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.79 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67				•	2.91
N-Pentane 1.87 Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					4.49
Hexanes 2.97 0.6911 85 5.09 Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					3.39
Heptanes 5.94 0.7026 99 8.75 Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					3.78
Octanes 6.29 0.7323 113 8.12 Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					
Nonanes 5.57 0.7665 129 6.30 Heavier Fraction 70.62 0.8514 216 47.67					8.75
Heavier Fraction 70.62 0.8514 216 47.67	_				8.12
					6.30
Total 100.00 100.00	Heavier Fraction	70.62	0.8514	216	47.67
	Total	100.00		•	100.00

Pentane-Free Fraction

Properties of Hexane Plus:

Density, gm/cc @ 60°F = 8421

Mol Weight = .205

TABLE III

Comparison of Experimental and Computed Flash Liberation Results

Source:

Octanes

Nonanes

Heavier Fraction

TOTAL

Esso Australia Ltd., Halibut Metered Liquid

Date Taken:

March 16, 1978

8.12

6.30

47.67

100.00

18.49

20.17

30.40

100.00

(P ₁)		Gas-Oil R	atio - cu	ft/bbl Residua	1 011	Residual Oil	Gravity	V /V on 1/0	•
Pressure	Temperature	Flashed a		Flashed from		°API at 6		V_r/V_{bp} or $1/B$	•
psig	°F	<u>Experimental</u>	Computed	Experimental	Computed	Experimental	Computed	<u>Experimental</u>	Computed
0	77	70	-	-		43.6		0. 9 011	

Data Used in Flash Calculations

K-value Source: NGAA (1957) Component Mo1 % gal/mol Convergence Pressure: 10000 psia Hydrogen Sulfide Nil Carbon Dioxide 5.17 Unadjusted Flash Data 0.76 6.38 Nitrogen 0.16 Methane 3.09 Molecular weight of heavier fraction 216 Density of heavier fraction, gm/cc at 60°F 0.8514 Ethane 1.55 Specific volume of flowline fluid at 230 Propane 3.94 Iso-Butane psig bubble point and 198 °F, 2.91 0.02147 cu ft/1b N-Butane 4.49 3.39 Mols per barrel 1.801 Iso-Pentane N-Pentane 3.78 14.74 Hexanes 5.09 Heptanes 16.88 8.75

KINGFISH A PLATFORM METERED LIQUID

TABLE IV

Pressure-Volume Relations of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish A Platform Metered Liquid

Date Taken: September 1, 1977, 1700 hours

Sampling Conditions: 690 psig and 90°C (194°F)

Pressure, psig	Relative Volume, 0 194°F	Density gm/cc @ 194°F		
1000 896 775 690 P _b = 624	0.9948 0.9963 0.9980 0.9991 1.0000	0.6893 0.6882 0.6871 0.6863 0.6857		
Volume @ 14.73 psia & 60°F Volume @ 14.73 psia & 194°F	0.9297*			
gm/cc @ 14.73 psia & 60°F		0.7897*		
Volume @ 14.73 psia & 60°F Volume @ 690 psig & 194°F	0.7976*			

^{*}Based on residual liquid from an atmospheric flash liberation at 70°F having a density of 47.5° AP/0 60 F

Specific volume at saturation pressure = 0.02336 cu ft/lb

TABLE V Hydrocarbon Analysis of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish A Platform Metered Liquid

Date Taken: September 1, 1977, 1700 hours

Component	Weight%	Density (gm/cc@60°F)	Mol. Weight	Mo 1%
Component	WEIGHT.	(gm/ccedo 1/	<u>ne i giro</u>	
Carbon dioxide	0.12			0.32
Nitrogen	0.04			0.17
Methane	1.52			11.04
Ethane	1.19			4.61
Propane	2.77			7.32
iso-Butane	2.04			4.09
n-Butane	3.15			6.31
iso-Pentane	2.16			3.49
n-Pentane	2.51			4.05
Hexane	4.58	0.6952	87	6.13
	7.36	0.7105	97	8.84
Heptanes	7.34	0.7423	112	7.63
Octane			121	6.56
Nonane	6.81	0.7574		
Decane Plus	<u>58.41</u>	0.8364	231	29.44
	100.00			100.00

Properties of Hexane Plus:

Density = gm/cc @ 60°F = 0.8221 Mol. Wt. = 168

Comparison of Experimental and Computed Flash Liberation Results

Source: Esso Australia Ltd., Kingfish A Platform Metered Liquid

Date Taken: September 1, 1977, 1700 hrs

 ∞

Bubble Point Pressure: 624 psig at 90°C(194°F) Sampling Pressure: 690 psig and 90°C

(P ₁) Pressure <u>psig</u>	Temperature <u>°F</u>	Flashed a	t Pj	ft/bbl Residual Oil Flashed from P ₁ to Experimental Comput		t 60°F	V _r /V _{bp} or 1/B Experimental	
0	70	265		-	47.5		0.7969	
0	*		269	-		47.4		0.7958

			Data Used in Flash Calculations	teritari katika di matana kana mangungan paga paga paga paga paga paga paga
Metered Lie			K-value Source: NGAA (1957)	
Component	Mo1 %	gal/mol	Convergence Pressure: 10,000 psia	
Hydrogen Sulfide	Nil			
Carbon Dioxide	0.32	6.38	Unadjusted Flash Data	
Nitrogen	0.17	4.16		
Methane	11.04		Molecular weight of heavier fraction	231
Ethane	4.61		Density of heavier fraction, gm/cc at 60°F	0.8363
Propane	7.32		Specific volume of metered fluid at 624	0.0000
Iso-Butane	4.09		psig bubble point and 194 °F,	
N-Butane	6.31		cu ft/lb	0.02336
Iso-Pentane	3.49		Mols per barrel	2.063
N-Pentane	4.05		1 1	
Hexanes	6.13	15.00	*65°F K values and a +3% adjustment to the	
Heptanes	8.84	16.36	decane plus density	
Octanes	7.63	18.08		
Nonanes	6.56	19.14	·	
Heavier Fraction	29.44	33.09	·	
TOTAL	100.00			

KINGFISH B PLATFORM METERED LIQUID

TABLE VII

Pressure-Volume Relations of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish B Platform Metered Liquid

Date Taken: July 21, 1977, 1500 hours

Sampling Conditions: 840 psig and 84°C (183.2°F)

Pressure, psig	Relative Volume, @ 183.2°F	Density gm/cc @ 183.2°F
1000 930 840 P _b = 785	0.9968 0.9979 0.9992 1.0000	0.7044 0.7036 0.7027 0.7021
Volume @ 14.73psia & 60°F Volume @ 14.73 psia & 183.2°F	0.9358*	
gm/cc @ 14.73 psia & 60°F		0.7910*
Volume @ 14.73psia & 60°F Volume @ 840 psig & 183.2°F	0.7966*	

^{*}Based on residual liquid from an atmospheric flash liberation at 70°F having a density of 47.2° AP/@ 60F

Specific volume at saturation pressure = 0.02281 cu ft/lb

TABLE VIII Hydrocarbon Analysis of Metered Liquid Sample

Source: Esso Australia Ltd., Kingfish B Platform Metered Liquid

Date Taken: July 21, 1977, 1500 hours

Component	Weight%	Density (gm/cc@60°F)	Mol. Weight	Mo1%
Carbon dioxide Nitrogen	0.14			0.36
Methane	0.04 2.09			0.16 14.93
Ethane Propane	1.31			4.99
iso-Butane	2.82 2.00			7.33 3.94
n-Butane iso-Pentane	3.07			6.05
n-Pentane	2.13 2.48			3.38 3.94
Hexane Heptanes	3.65 5.74	87	0.6952	4.87
Octane	7.31	98 111	0.7123 0.7427	6.71 7.55
Nonane Decane plus	6.10	119	0.7615	5.88
became plus	61.12	234	0.8389	<u>-29.97</u>
	100.00			100.00

Properties of Hexanes Plus:

Density = gm/cc @ 60°F = 0.8212

Mol. Wt. = 168

Comparison of Experimental and Computed Flash Liberation Results

Esso Australia Ltd., Kingfish B Platform Metered Liquid Source:

Date Taken: July 21, 1977, 1500 hrs. Bubble Point Pressure: 785 psig at 84°C(183.2° Sampling Pressure: 840 psig at 84°C

(P ₁) Pressure psig	Temperature °F	Flashed a	it Pj	ft/bbl Residua Flashed from Experimental	P ₁ to 0	Residual Oil °API at 6 Experimental	0°F	V _r /V _{bp} or 1/B Experimental	
0	70	349		-		47.2		0.7960	
0	*		350		~		47.2		0.7953

Data Used in Flash Calculations

		-	
Metered	Liquid		K-value Source: NGAA (1957)
Component	Mol %	gal/mol	Convergence Pressure: 10,000 psia
Hydrogen Sulfide	Nil		
Carbon Dioxide	0.36	6.38	Unadjusted Flash Data
Nitrogen	0.16	4.16	onadjusted Flush Dutu
Methane	14.93		Molecular weight of heavier fraction 234
Ethane	4.99		Daniel C.
Propane	7.33		Specific volume of meterod fluid at 705
Iso-Butane	3.94		nsig bubble point and 183 ØF
N-Butane	6.05		CA /71
Iso-Pentane	3.38		0.02201
N-Pentane	3.94		<u>2.147</u>
Hexanes	4.81	15.00	*75°F K values and a plus 3/4% adjustment to the decays
Heptanes	6.71		nlus density were used in the flack calculations
Octanes	7.55		pros density here used in the flash calculations.
Nonanes	5.88	18.73	
Propane Iso-Butane N-Butane Iso-Pentane N-Pentane Hexanes Heptanes Octanes	7.33 3.94 6.05 3.38 3.94 4.81 6.71 7.55	15.00 16.49 17.91 18.73	Specific volume of metered fluid at 785 psig bubble point and 183.2F, cu ft/lb Mols per barrel *75°F K values and a plus 3/4% adjustment to the decane plus density were used in the flash calculations.

12

Heavier Fraction

TOTAL

29.97

100.00

33.42

LONGFORD PLANT STABILIZER LIQUID

TABLE X

Pressure-Volume Relations of Stabilizer Liquid Sample

Source: Esso Australia Ltd., Longford Plant Stabilizer Liquid

Date Taken: October 14, 1977 @ 1500 hours

Sampling Conditions: 856 psig & 63°C (145.4°F)

Pressure, psig	Relative Volume, @ 145.4°F	Density gm/cc @ 145.4°F
1000 920 856 640 420 212	0.9927 0.9935 .0.9941 0.9958 0.9974 0.9988 1.0000	0.7692 0.7686 0.7681 0.7668 0.7656 0.7645 0.7636
Volume @ 14.73 psia & 60°F .Volume 14.73 psia & 145.4°F	0.9567*	
gm/cc @ 14.73 psia & 60°F		0.7982*
Volume @ 14.73 psia & 60°F Volume @ 856 psig & 145.4°F	0.9623*	

^{*}Oil density = 45.6° AP/@ 60° F Specific volume @ 856 psig & 145.4° F = 0.02085 cu ft/lb

TABLE XI Hydrocarbon Analysis of Stabilizer Liquid Sample

Source: Esso Australia Ltd., Longford Plant Stabilizer Liquid

Date Taken: October 14, 1977 @ 1500 hrs.

Sampling Conditions: 856 psig and 63°C (145.4°F)

Component	Weight %	Density (gm/cc @ 60°F)	Mol Weight	Mol %
Carbon dioxide	0.13			0.48
Nitrogen	0.09			0.52
Methane	0.01			0.10
Ethane	0.01			0.05
Propane	0.28			1.03
iso-Butane	0.44			1.23
n-Butane '	1.05			2.93
iso-Pentane	2.35			5.29
n-Pentane	2.24			5.04
Hexane	4.37	0.7064	90	7.88
Heptanes	5.09	0.7229	104	7.94
Octane	7.10	0.7388	116	9.93
Nonane	7.60	0.7578	124	9.95
Decane Plus	69.24	0.8124	236	47.63
			200	-47.03
Total	100.00			100.00

Properties of Hexane Plus: Density = gm/cc @ 60°F. = 0.7949 Mol. Wt. = 161

This is an enclosure indicator page.

The enclosure PE904844 is enclosed within the container PE904839 at this location in this document.

```
The enclosure PE904844 has the following characteristics:
    ITEM_BARCODE = PE904844
CONTAINER_BARCODE = PE904839
            NAME = Halibut 1 F.I.T. Data
           BASIN = GIPPSLAND
          PERMIT = VIC/L5
            TYPE = WELL
         SUBTYPE = FIT
      DESCRIPTION = Halibut 1 Formation Interval Test
                   (F.I.T.) Data
         REMARKS =
     DATE_CREATED =
    DATE_RECEIVED =
            W_NO = W507
        WELL_NAME = Halibut-1
       CONTRACTOR =
     CLIENT_OP_CO = Esso Australia
```

6. Vitrinite Reflectance Measurements * Rock - Eval Data Sheet.

Jack Dami

RECD 22.4.8. KGO.



April 16, 1986

The Director of Mines,
Department of Minerals and Energy,
East Tower, Princes Gate,
151 Flinders Street,
Melbourne. Vic. 3000

Dear Sir,

Amoco Australia Petroleum Company

(Inc. in Delaware, U.S.A., with Limited Liability — Registered as a Foreign Company in Tasmania)

15 Blue Street, North Sydney P.O. Box 126, North Sydney 2060 Phone (02) 957 4500 Telex AA23359

Telex AA23359 Facsimile (02) 922 4886

22 APR 1986



Re: Gippsland Basin Vitrinite Reflectance Measurements ${\tt MISC-AUP-141-L-310-SCB}$

In 1985 Amoco Australia Petroleum Company collected core and cutting samples from thirteen Gippsland Basin wells for vitrinite reflectance determinations. The following attachments are a summary of the work.

Yours faithfully,

HALIBUT-1

S.C. Bane Exploration Manager

SCB/1rc

Attach.

Depth	Mean Maximum Reflectance	Standard Deviation	Range	Number of Determinations
(ft)	(%)			7.
ALBACORE -1 9380&9390	0.42	0.04	0.31-0.48	42
9720&2730	0.46	0.06	0.36-0.59	36
10070	0.46	0.04	0.36-0.55	39
10320	0.47	0.04	0.38-0.54	34
BARRACOUTA-	· <u>3</u>			
7310-7320	0.54	0.05	0.46-0.63	35
8590	0.60	0.08	0.43-0.71	35
9100-9120	0.62		0.41-0.80	41
9330-9360	0.64	0.10	0.43-0.93	36
9540-9560	0.73	0.05	0.63-0.84	33
BATFISH-1				
7560-7570	0.61	0.05	0.53-0.69	34
8170-8180	0.64	0.05	0.56-0.75	34
8640-8650	0.69	0.05	0.55-0.81	31
9170-9190	0.76	0.04	0.66-0.81	28
9430-9450	0.76	0.05	0.69-0.90	41
BONITA-1A				
9780-9790	0.54	0.06	0.46-0.68	36
10050	0.56	0.05	0.47-0.64	36
10280-102	90 0.55	0.04	0.47-0.64	47
BREAM-2				
8070-8090	0.63	0.05	0.52-0.70	39
8380-8390	0.67	0.06	0.53-0.80	41
8933-8944	0.73	0.05	0.62-0.85	43
9730-9750	0.83	0.07	0.71-0.98	38
10638-106	0.88	0.11	0.62-1.13	42

Depth	Mean Maximum Reflectance	Standard Deviation	Range	Number of Determinations
(ft)	(%)	DCV / UC / OII		
COD-1				
7100-7120	0.63	0.06	0.53-0.81	41
8333-8339	0.59	0.05	0.47-0.67	34
9030-9060	0.75	0.06	0.61-0.85	32
9460-9470	0.77	0.06	0.61-0.86	41
FLOUNDER-1				
7430	0.44	0.05	0.36-0.56	39
8783-8795	0.64	0.04	0.56-0.77	36
9140	0.61	0.06	0.52-0.77	42
10395-10400	0.72	0.06	0.58-0.80	34
11350-11356	0.90	0.05	0.76-0.97	36
11676-11682	2 0.90	0.07	0.78-1.04	44
HALIBUT-1				
7888-7891	0.49	0.07	0.37-0.67	39
8450-8460	0.54	0.04	0.47-0.61	31
9250-9260	0.57	0.06	0.46-0.66	43
9630-9640	0.61	0.04	0.54-0.69	35
9870-9880	0.63	0.06	0.47-0.75	52
MACKEREL-1				
8760-8780	0.63	0.05	0.52-0.71	31
9630-9650	0.66	0.05	0.69-0.76	25
9870-9890	0.65	0.02	0.60-0.73	28

Depth	Mean Maximum Reflectance	Standard Deviation	Range	Number of
(ft)	(%)	Deviation		Determinations
MARLIN-1				
7070-7080	0.65	0.08	0.52-0.80	32
7497-7501	0.65	0.04	0.54-0.72	38
7780-7800	0.67	0.09	0.47-0.88	39
8230-8240	0.71	0.07	0.64-0.79	4
8455-8461	0.70	0.06	0.56-0.79	32
NANNYGAI-1	. • 4			
7760-7670	0.052	0.07	0.39-0.65	33
8320-8340	0.50	0.05	0.42-0.65	32
9450-9470	0.64	0.04	0.57-0.71	35
9860-9880	0.64	0.06	0.51-0.75	31
SALMON-1				
7670-7690	0.50	0.06	0.38-0.64	35
8030-8050	0.56	0.05	0.45-0.67	37
8860	0.60	0.05	0.45-0.67	33
9250-9260	0.64	0.06	0.54-0.79	36
9856-9862	0.80	0.05	0.68-0.87	37
SNAPPER-1				
7280-7300	0.56	0.06	0.43-0.69	37
7754-7760	0.56	0.09	0.38-0.73	38
9254-9257	0.68	0.03	0.60-0.72	33
9900-9903	0.86	0.10	0.62-0.96	17
10140-10200	0.81	0.10	0.58-1.01	. 31
10495-10507	0.99	0.06	0.81-1.06	35

0.5 JUL 1984

			0.0		·			
Sample No. or Depth	% - TOC	\$ 1 (mg/g)	S ₂ (mg/g)	53 (mg/g)	T max (°C)	Hydrogen Index	Oxygen Index	'52/53
\$1.25 mar 12.21			Hali	but-16	Pell	·		
8320-8346	£ 67.27	1326	194.86	5.61	419	289.6	8.3	34.72
	3.08	0.24	1.67	9.11	432	54.2	295.7	D·18
8680-8720 C	5903	11.14	183.91	S.52	421	311.6	9.4	33.29
ع الإسلام	2.84	0.28	2.35	4.19	435	82.9	147.4	0.56
9450-9460c	70.50	7.85	14.87	521	419	229.6	67. 4	24.48
, ,	10.95	1.36	24.05	2.04	427.	219.6	18.7	11.77
9510-9520c	70.35	624	141.19	5.77	424	260.7	8.2	3.42
" S	8.56	Ð.48	14.41	1.93	432	168.3	23.2	7.48
9630-870C	72.87	11.40	176.62	688	422	242.4	9.4	25.67
""'''''''''''''''''''''''''''''''''''''	7.05	0.60	10.07	2.09	434	142.8	29.6	4.82
9750 -97906	64.55	8-37	157.76	6.26	426	244.4	9.7	92.7I
1 11 5	7.40	0.79	10.26	1.97	431	138.6	26.6	5.22
								· ·
Tuna-14	Dell							<u> </u>
5200-52300		4.22	85.92	14.77	428	136.7	235	5.81
1"5								!
5660-5710C	64.81	4.71	76.75	9.12	424	1/8.4	14.1	8.47
ی، چی		•	,					
5800 - 5830C	400	3.47	45.10	16.78	425	75.1	27.9	2.69
\ 'n <u>s</u>							_	<u> </u>
6020-60406	48.53	6.00	91.43	8.54	425	188.4	17.6	10.71
1115						!		1
6200 -627PC	62.65	3.07	65.42	19.14	474	104.4	30.6	7.23
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6370:6390c	64.49	5.04	98.32	13.62	473	152.5	21.1	10-44
".5		F.					15.1	0.55
9150-91700	64.22	2.70	94.44	9.86	434	147.1.	15.4	9.58
<u> </u>			0- 11	70 - 1	.6.	1115	20.2	
2110-94300	65.33	3.78	92.41	13.25	431	141.5	20.3	6.97
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C= COAL S= SHALE

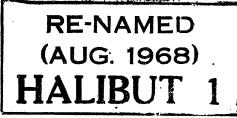
7. Velocity Survey * Time - Depth Curve.

VELOCITY SURVEY

ESSO HALIDUT A-1

Ву

R.J. Steele



A. INTRODUCTION

Esso Australia contracted the United Geophysical Corporation to carry out the velocity survey. United furnished the following:

1) Instruments -

- a. SSC Model GCE 101 Pressure Sensitive Well Geophone.
- b. Model 1-27 United Refraction Amplifier with nickelcadmium power supply.
- c. Electro-tech ER-62 standard 25 trace camera.
- d. Two F-M Transceivers.
 - (1) PYE "Premier" Type MFV-516
 - (2) AWA "Carphone"
- e. One 70 Volt Blaster.
- f. Additional sundry equipment.

2) Personnel -

One Marine Shooter, M. Clark, one Instrument Operator, W.J. Larson and one Geophysical Supervisor, B.H. Flusche.

3) Shooting Boat -

One licensed shooting boat - "Pasadena Star".

All equipment and personnel were assembled on Glomar III by August 4, 1967 and the survey was made on August 5, 1967.

B. SURVEY PROCEDURES

Weather was exceptionally good during the survey and no operational difficulties were encountered.

1) Shot Positioning -

The orientation of Glomar III was SW - NE during the survey and a buoy was positioned at 1000 feet on either side of the ship along a line passing NW - SE through the well site. Exact shot offsets were obtained from water arrivals at the well, measured by two geophones lowered into the moonpool.

2) Shot Size -

All shors were 33.3 lbs.

3) Well Geophone Positioning -

All depth measurements were made using the Schlumberger depth indicator. To minimize rig noise the marine riser was disconnected from the derrick floor and lowered to the casing top. The cable was clamped with a T-bar device which rested on the casing top at each geophone position to de-couple from rig movement.

4) <u>Time</u> -

The first charge was shot at 8:35 am and the last at 12 noon. The velocity survey took just over 4 hours of rig time.

5) Instrumentation -

The seismic recording instruments were assembled in the core lab. This afforded reasonably good communication with Schlumberger and the derrick floor.

The survey records consist of 6 traces. Traces 1-3 recorded the well geophone break at 3 different recording levels. Traces 4 and 5 recorded the water arrivals at the 2 geophones in the moonpool. The time break was recorded on trace 6.

6) Instrumental Checks -

Subsequent to the velocity survey, several instrumental checks were carried out:

- a. Time Break Cable break check.
- b. Timing line check.
- c. Pulse test to reveal any relative delays between the 6 traces.

These test trips are included in the folder of this report.

C. RESULTS

A total of twelve shots were made at six different levels. The first six shots were set off near the NW 1000 foot buoy as the well-phone was lowered into the hole. The six repeat shots were set off near the SE 1000 foot buoy as the well-phone was withdrawn.

The quality of the records is considered good. The time and water breaks are excellent in all cases. The well-phone breaks are generally good but not as sharp as the corresponding time and water breaks. There was an apparent ambiguity in the well-phone break in both records shot at 7011 feet (KB). However a comparison of interval velocities with the integrated sonic log resolved this problem.

All the records are included in the folder of this report.

The final check-shot times and the integrated sonic times are compared in the error chart (fig.1) which shows them to be in good agreement.

D. CONCLUSION

The velocity survey was successful in tying the integrated Sonic Log to absolute time values.

ESSO HALIBUT A-1

VELOCITY SURVEY ERROR CHECK

Figure 1

	•	•		•	•	
Depth Rel.S.L.	Av. Vertical Travel Time (Check Shots)	Ti Check Shots (Sec.)	Ti Sonic Log (Sec.)	(Millisecs.)	Depth Interval (Ft.	Error (Microsec per Ft.)
3004	•385	•				
		.099	.097	+ 2	992	+ 2
3 996	.484		•	· · · · · · · · · · · · · · · · · · ·		
3996	484			• .		
		.147	.143	+ 4	1769	+ 2
5765	.631			erina. Karan	•	
5765	.631				•	
	• .	.121	.116	+ 5	1215	+ 4
6980	.752	•				
6980	.752				•	
		•049	.048	+ 1	481	+ 2 ·.
7461	. 801					
7461	.801					
		.078			959	- 3
8420	.879	•		•		
ALTERN	ATIVE INTERPRETA	TION OF 701	1' (KB) SHO	r:	•	
5765	.631					1
		.114	.116	- 2	1215	- 2
6980	.745				*>	
6980	745	.056	•048	+ 8	481	+17 *

^{*} SONIC LOG DISCREDITS ALTERNATIVE INTERPRETATION.

	-							Direction fr	om Well		a m p a n	у		Well			Eleve		Depth				N O	
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	12	A B	/=-00	3039		.001	.230	.410 .408	G G	2999	1150	.384	.734 .740		r, c	.001	.324 .324	375	3004		.385	1	1,500	De Ds Flevation Datum Plane Flavation Shat!
	2	A B	08-56 11-50	11027 11021		.001	.2.31	,503 .500	F		1155	.270	.960	.482	5			.484	3776	1		10,000	32.60	
	3	Ā	09-25 11-25		1				<u> </u>	3760	1975	.187	.983	. 632.	'53	· ·		.631	5765	1769	.147	12,000	714.0	0 on C11 (51)
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......Weather.....

REPORT ALL ACCIDENTS, HOWEVER SLIGHT

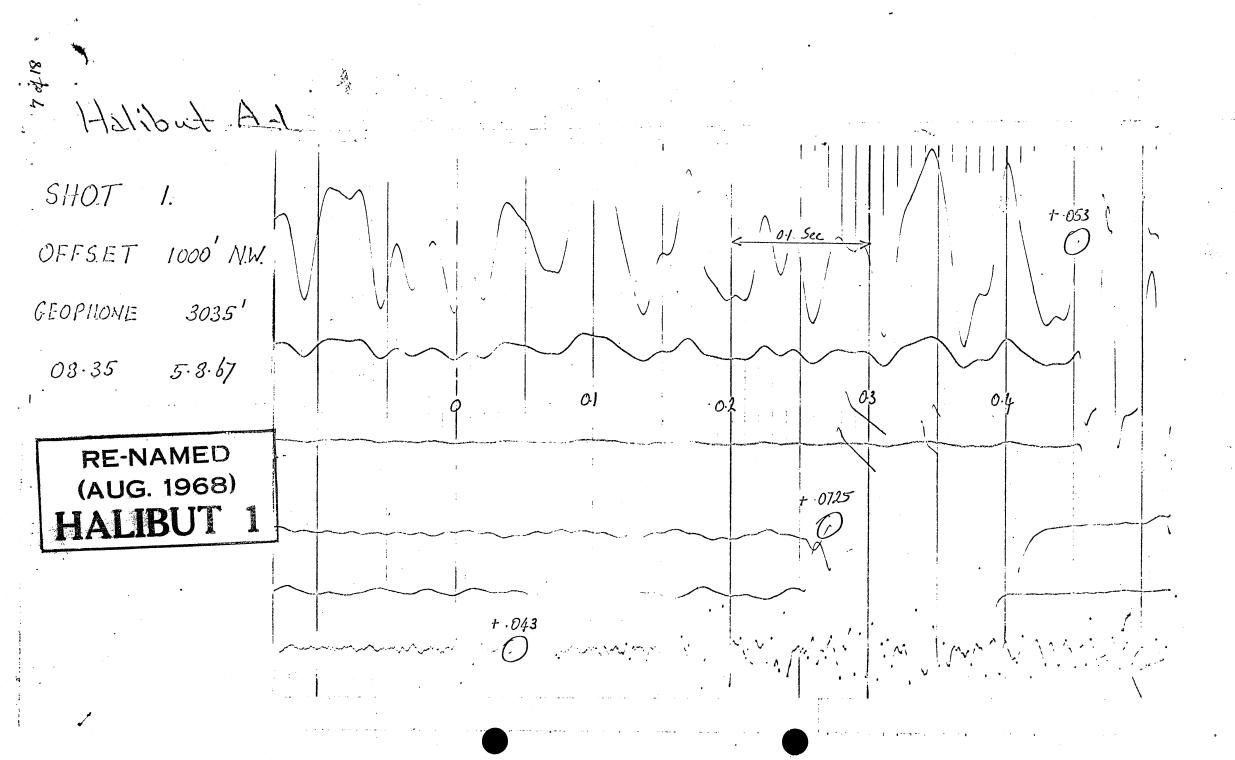
were your meter

DUPLICATE — Party File TRIPLICATE — Supervisor

QUADRUPLICATE - Remains in Book

81to 9

PARTY CHIEF/MGR.

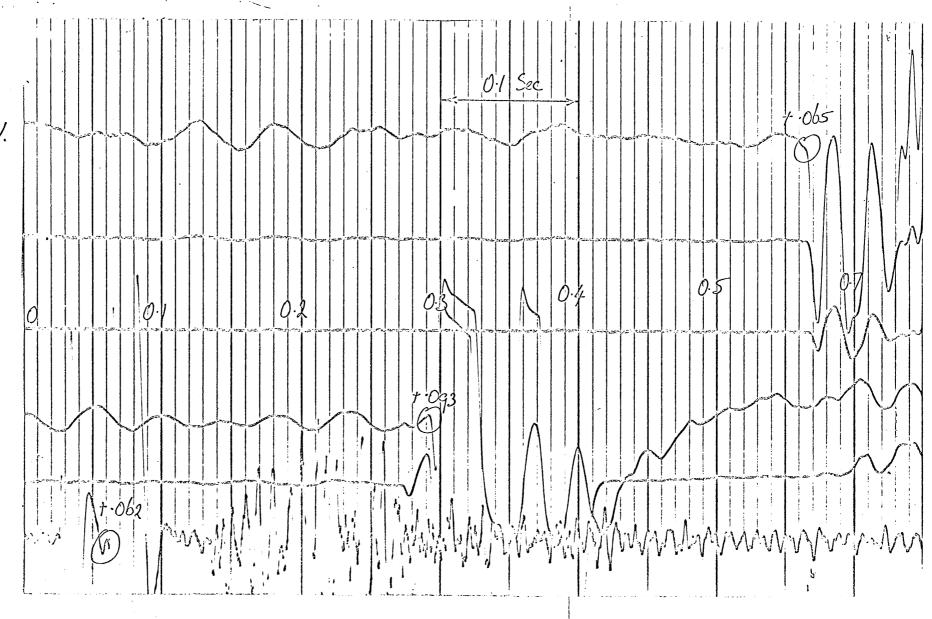


SHOT 2.

OFFSET 1000' N.W.

GEOPHONE 4027'

03.56 5-8-67



This is an enclosure indicator page.

The enclosure PE904845 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904845 has the following characteristics:

ITEM_BARCODE = PE904845

CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND

PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 3

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.
The enclosure PE904846 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904846 has the following characteristics: ITEM_BARCODE = PE904846

ITEM_BARCODE = PE904846 CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 4

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page. The enclosure PE904847 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904847 has the following characteristics:

ITEM_BARCODE = PE904847 CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 6

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.

The enclosure PE904848 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904848 has the following characteristics:

ITEM_BARCODE = PE904848
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND

PERMIT = VIC/L5 TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 5

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.
The enclosure PE904849 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904849 has the following characteristics:

ITEM_BARCODE = PE904849
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 7

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.

The enclosure PE904850 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904850 has the following characteristics:

ITEM_BARCODE = PE904850
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 8

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.
The enclosure PE904851 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904851 has the following characteristics:

ITEM_BARCODE = PE904851

CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND

PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 9

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.

The enclosure PE904852 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904852 has the following characteristics:

ITEM_BARCODE = PE904852

CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Velocity Survey

BASIN = GIPPSLAND

PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Velocity Survey

REMARKS = Shot 10

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = United Geophysical Corporation

CLIENT_OP_CO = Esso Australia

7 4 18

SHOT 11.

OFFSET 1000' S.E.

GEOPHONE 4026'

11-50 5-3-67

0.1 Sec 4.018 Lander My May May May be well and he was her was from the May was here

RE-NAMED
(AUG. 1960)
HALIBUT 1

81 18

S110T 12.

OFFSET 1000 S.E.

GEOPHONE 3034'

12.00 5-8-67

0.1 Sec 1-055 + 049

RE-NAMED (AUG 1968) HALIBU 1

This is an enclosure indicator page.
The enclosure PE904853 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904853 has the following characteristics:

ITEM_BARCODE = PE904853
CONTAINER_BARCODE = PE904839

NAME = Time - Depth Curve

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Time - Depth Curve

REMARKS = DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR =

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.

The enclosure PE904854 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904854 has the following characteristics:

ITEM_BARCODE = PE904854
CONTAINER_BARCODE = PE904839

NAME = Time - Depth Curve

BASIN = GIPPSLAND

PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = VELOCITY_CHART

DESCRIPTION = Halibut 1 Time - Depth Curve

REMARKS = Client Copy. Confidential information removed. As copy is reduced in size from the original the vertical scale

varies.

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR =

CLIENT_OP_CO = Esso Australia

8. Enclosures.

This is an enclosure indicator page.

The enclosure PE904855 is enclosed within the container PE904839 at this location in this document.

The enclosure PE904855 has the following characteristics:

ITEM_BARCODE = PE904855
CONTAINER_BARCODE = PE904839

NAME = Completion Coregraph

BASIN = GIPPSLAND

PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = DIAGRAM

DESCRIPTION = Halibut 1 Completion Coregraph

REMARKS = Cores 2-16.

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = Core Laboratories, INC.

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page.
The enclosure PE603186 is enclosed within the container PE904839 at this location in this document.

```
The enclosure PE603186 has the following characteristics:
     ITEM_BARCODE = PE603186
CONTAINER_BARCODE = PE904839
            NAME = Halibut 1 Grapholog (Mud Log)
           BASIN = GIPPSLAND
           PERMIT = VIC/L5
             TYPE = WELL
          SUBTYPE = MUD_LOG
      DESCRIPTION = Halibut 1 Grapholog (Mud Log)
          REMARKS =
     DATE_CREATED =
    DATE_RECEIVED =
             W_NO = W507
        WELL_NAME = Halibut-1
       CONTRACTOR = Core Laboratories, INC.
     CLIENT_OP_CO = Esso Australia
```

This is an enclosure indicator page.

The enclosure PE603187 is enclosed within the container PE904839 at this location in this document.

The enclosure PE603187 has the following characteristics:

ITEM_BARCODE = PE603187
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Grapholog (Mud Log)

BASIN = GIPPSLAND PERMIT = VIC/L5

TYPE = WELL

SUBTYPE = MUD_LOG

DESCRIPTION = Halibut 1 Grapholog (Mud Log)

REMARKS = Second copy (incomplete)

DATE_CREATED =

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = Core Laboratories, INC.

CLIENT_OP_CO = Esso Australia

This is an enclosure indicator page. The enclosure PE603188 is enclosed within the container PE904839 at this location in this document.

The enclosure PE603188 has the following characteristics:

ITEM_BARCODE = PE603188
CONTAINER_BARCODE = PE904839

NAME = Halibut 1 Hydrocarbon Analysis

BASIN = GIPPSLAND PERMIT = VIC/L5 TYPE = WELL

SUBTYPE = MUD_LOG

DESCRIPTION = Halibut 1Hydrocarbon Analysis-

Formation Description, Mud Data, Drill

Stem Tests, etc.

REMARKS =

DATE_CREATED = 29/08/67

DATE_RECEIVED =

 $W_NO = W507$

WELL_NAME = Halibut-1

CONTRACTOR = Core Laboratories, INC.

CLIENT_OP_CO = Esso Australia