



AGRICULTURE • RESOURCES • CONSERVATION • LAND MANAGEMENT

WELL SUMMARY SOLE-1 (W666)

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SOLE-1 (W666)

Well Summary Report

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WELL SUMMARY REPORT



WELL SUMMARY

BASIC

41 pages

 $\frac{1}{3}$

SHELL SOLE-1 (VIC./P9)

1. <u>Purpose of well</u>

The exploration well Sole-1 was drilled to test the sandstones of the Eocene Latrobe Valley Formation in an E-W oriented anticline straddling the boundary between Shell's Vic/P9 and Esso-BHP's Vic./P1 permits.

2. Well statistics

Location	:	31 nautical miles from Marlo, Victoria.
Co-ordinates	:	Latitude 38° 06' 59.5" S Longitude 149° 02' 04.4" E
Elevation	:	Rotary table - datum for depth measurements. - 32 ft. above mean sea level. - 455 ft. above sea floor.
Total Depth	:	3,703 feet.
Date drilling commenced	:	28th January, 1973.
Date total depth reached	:	5th February, 1973.
Date well- abandoned	:	9th February, 1973.
Drilling time in days		13 (to abandonment).
Status	:	Plugged and abandoned. Cleared sea floor of all drilling material.
		Plugs : 2850'-1858' 700'- 505'

Holes sizes and depths

36" hole to 500 ft. 26" hole to 972 ft. 13 $\frac{3}{4}$ " hole to 2230 ft. 9 $\frac{7}{8}$ " hole to 3703 ft.

Casing and cementing details

	Size W e ight	30" 310 lbs/ft	20" 91.51 lbs/ft	$10\frac{3}{4}$ " 40.5 lbs/ft
,	Grade	1" WT	X-52 LP	J55
	Range			3
	Set at	475'	952'	21991
	Cemented to		sea floor (estimated)	630' (TS)

t n

SC DATA

0-2230'	:	Type : seawater	$e^{i - \frac{1}{2}} = \frac{1}{2}$
		Average weight : 9.0 lbs/gal .	
		Treatment : None. Before running the $10\frac{2}{4}$ "	
		casing, the hole was displaced to sweet wat bentonite/lignosulfonate mud.	ər/
2230' - TD	:	Type : sweet water/bentonite/lignosulfonate Average weight : 10.7 lbs/gal.	
		Treatment : Addition of lignosulfonate was	
		necessary to keep viscosity down.	e i se se

Perforations :

None

Plug back jobs :

Plug No.	Length of plug (ft)	Sacks of cement	Tested
1	2850-1858 (992)	650	10,000 lbs
2	700- 505 (195)	100	

3. Formation Sampling

Ditch Cuttings :	Cuttings were collected at the sh intervals after drilling out the	
Coring :	No cores were taken.	
Side wall sampling :	A total of 90 samples were tried, fecovered.	of which 85 were

Logging and Surveys

4.

vercocity survey	Electric logs	FDC/GR	: 3708'-2190', 2226'-952' : 3708'-2190', 2226'-952', : 3708'-2190' : 3699'-2190', 2226'-952' : 3695'-2190', 2223'-952' : 3703'-2190' survey	, GR to	450'
------------------	---------------	--------	---	---------	------

Penetration rate and gas logs : Recorded by Baroid, ADT-unit. A continuous record of gas in the mud was kept using a Hot Wire Detector and Gas Chromotograph from the 20" casing shoe

Deviation	surveys:	Totco	recorders	were used	;
		Depth	972 ft,	Deviation	10
		- 11	1258 ft,	11	10
		n	2230 ft,	11	30
	14	11	3703 ft,	• •	10

to total depth.

Temperature surveys

:

A temperature survey was run to detect the top of the cement behind the $10\frac{3}{4}$ " casing. Top cement was found at 630 ft.

23

Testing

F.I.T. Test 1 F.I.T. Test 2 F.I.T. Test 3 F.I.T. Test 4	3160' 2728'	Seal failed Formation tight Seal failed
F.I.T. Test 5 F.I.T. Test 6	2727 ' 2673 ' 2791 '	Seal failed Recovered 61.2 cf gas + 1200 cc mud $<, +C$ Seal failed
F.I.T. Test 7 F.I.T. Test 8	2695 ' 2829 '	Recovered 57.9 cf gas + 1400 cc mud $\subset, +C$ Seal failed

Sole -1.

6. Lithology

<u>990-2096</u> ' : 301.75-638.86 m	MARL, grey-green, fossiliferous, soft, slightly pyritic and glauconitic, containing thin beds of slightly harder ARGILLACEOUS LIME MUD, fossiliferous, slightly pyritic.
<u>2096-2657'</u> :	MARL, pale grey-green. fossiliferous, soft

638.86 809.85m HARD, pare grey-green, fossiliferous, soft, slightly pyritic and pure LIME MUD, containing rare thin beds of slightly harder ARGILLACEOUS LIME MUD, fossiliferous.

<u>2657-3355'</u>: QUARTZ SANDSTONE, grey-white, fine-medium grained, 809.85-102264 sub-angular to sub-rounded, poor-moderate sorting, M slightly pyritic, occasionally argillaceous,

interbedded with SILTSTONE, dusky brown, micaceous. Thin COAL beds occur at 3180'.

<u>3355-3522</u>': QUARTZOSE SANDSTONE, green, mottled, chloritic, silty, lithic fragments, micaceous, containing thin beds of CLAYSTONE, olive grey, chloritic slightly calcareous.

<u>3522-3703</u>' : 1073,50 - 1128:67 m

CLAYSTONE, olive grey, chloritic, friable to moderately hard, slightly calcareous, containing thin beds of QUARTZOSE SANDSTONE and SILTSTONE, green, mottled lithic fragments, micaceous.

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WELL HISTORY

The drilling ship "Glomar Conception" under contract to Head Australia Limited, was released to S.D.A. for the drilling of this well.

The rig arrived on location on 27th January 1973. Some delays were experienced laying the anchors due to bad weather.

Sole No. 1 was spudded in on 28th January at 23.00 hours. Water depth at the location was 423 feet and the distance from rotary table to seafloor was 445 feet.

A 36" hole was drilled to 500 feet using a 26" bit and 36" hole opener. 26" hole was drilled to 972 feet and 20" casing run to 952 feet and cemented to seabed. BOP's were installed and tested to 5000 psi.

A $13\frac{3}{4}$ " hole was drilled to 2230 feet using seawater as a drilling fluid. Displaced hole to mud and ran Schlumberger logs and took sidewall samples. $10\frac{3}{4}$ " casing was run to 2199 feet and cemented to 630 feet. Tested BOP's to 1400 psi.

Drilled $9\frac{7}{8}$ " hole to 3703 feet using sweet water/bentonite mud. Ran Schlumberger logs, took sidewall samples and wireline formation tests.

Set cement plugs 2850'-1858' and 700'-505'. Retrieved well head, guide frames and casing to 24 feet below seabed.

Sole No. 1 was abandoned on 9th February at 14.30 hours, and the "Glomar Conception" released to Esso Australia Limited.



FIG. | SDA DRG No. 6741

PART I : DRILLING AND GENERAL INFORMATION

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			1.1 <u>GENERAL DATA</u>
(i)	Well	8	Sole No. 1
(ii)	Operator	8	Shell Development (Australia) Pty. Ltd., 155 William Street, <u>MELBOURNE</u> , VIC. 3000.
(iii)	Permit	80	Vic./P9
(iv)	Location	00	31 nautical miles from Marlo, Victoria.
(v)	Co-ordinates	9	Latitude 38° 06' 59.5" S Longitude 149° 02' 04.4" E
(vi)	Elevation		Rotary table - datum for depth measurements. - 32 ft. above mean sea level. - 455 ft. above sea floor.
(vii)	Total Depth	8	3,703 feet.
(viii)	Date drilling commenced	e •	28th January, 1973.
(ix)	Date total depth reached	0 5	5th February, 1973
(x)	Date well abandoned	0	9th February 1973.
(xi)	Drilling time in days	÷	13 (to abandonment)
(xii)	Status	e 0	Plugged and abandoned. Cleared sea floor of all drilling material.
			Plugs : 2850'-1858'

700'- 505'

2.

DRILLING DATA

(i) Name and address of drilling contractor:

Global Marine Drilling Company, Global Marine House, 811 West Seventh Street, Los Angeles, California 90017, U.S.A.

- (ii) Drilling plant : Drilling ship "Glomar Conception"
 Builder : Levingstone Shipbuilding Company.
 Maximum loaded displacement : 11,220 LT
 Maximum variable load : 6,454 LT
 Storage capacity mud : 2,810 bbl
 drilling water: 15,200 bbls
 bulk cement : 4,100 cu.ft.
 bulk mud : 8,200 cu.ft.
 sacks : 11,000 sacks
- (iii) Mast/Derrick :
 Global Marine design. 142' x 61' x 38'.
 Hock load capacity : 1,000,000 lbs.
- (iv) Pumps :

2 National N-1300 duplex $7\frac{1}{4}$ " x 16" pumps. Powered by dual GE 752 RI electric motors, independently driven.

(v) Blowout preventer equipment.

Blowout preventer stack $16\frac{3}{4}$ " 5000 MSP, consisting of three Cameron type U- BOP's, one Shaffer $16\frac{3}{4}$ " 5000 psi shear ram, one Gk Hydril and one Shaffer Spherical Bag Type BOP, $16\frac{3}{4}$ " 5000 psi working pressure.

(vi) Hole sizes and depths

36" hole	\mathbf{to}	500	ŕt.
26" hole		972	ft.
13국" hole	to	2230	ft.
97" hole	to	3703	ft.

(vii) Casing and cementing details

Size	30"	20"	107"
Weight	$310 \ lbs/ft$	91.51 lbs/ft	40.5 lbs/ft
Grade	1" WT	X-52 LP	J55
Range	(Canal)	463	3
Setat	475'	952'	21991
Cemented to	se	a floor (estimated)	630' (TS)

(viii) Drilling fluid

9		
0-2230'	8	Type : seawater Average weight: 9.0 lbs/gal. Treatment : None. Before running the $10\frac{3}{4}$ " casing, the hole was displaced to sweet water/ bentonite/lignosulfonate mud.
2230'-TD	a P	Type : sweet water/bentonite/lignosulfonate Average weight : 10.7 lbs/gal Treatment : Addition of lignosulfonate was

Treatment : Addition of lignosulfonate was necessary to keep viscosity down.

Average weekly analysis:

3.

4.

	Week	ppg	Viscosity MF	<u>Fluid loss</u> <u>cc</u>	Filtercake (<u>1/32 m</u>)	Sand Z	PH
	27/1-2/2 3/2-10/2		28 46	3.8	2		10.5
	Total mud	l materi	als consum.	ed :			
	Barytes Aquagel Q-Broxin CC-16 Soda-ash Caustic		118 x 50	lbs lbs lbs lbs			
(ix)	Perforati	on and	shooting r	ecord: No	perforating v	vas carri	ed out.
(x)	Plug back	jobs :					
•	Plug No.	Leng	th of plug	<u>(ft</u>) <u>s</u>	acks of cemer	nt	Tested
	1 2		2850-1858 700- 505	(992) (195)	650 100		10,000 lbs
(xi)	Fishing o	peratio	ns and hole	e troubles:			
	No fishin	g opera	tions were	performed a	nd no hole tr	rouble exp	perienced.
(xii)	Sidetrack	ed hole	: Nil.	Ð			
LOCAT	ION						
(i)	Site inve	stigati	ons carried	lout : N	one		
(ii)	Anchoring	method	5 2				
	All moorin	ng line: ore tha	30.000 lbs s made of 2 n 2200 feet	a inch stud	link chain a	nd	
(iii)	Transporte	ation :					
	The rig wa "Lady Laun "Smit-Lloy	rie" 5	545 Ton.	following s	supply boats		
	Two helico Airfast tu at Marlo.	opters,1 ransport	Bell-205 ced personn	and 1 Alloue el between 1	ette-3 , contra the rig and t	acted fro he airstr	m ip
FORMAT	FION SAMPLI	ING					
(i)	Ditch cutt	ings :					
	Cuttings w after dril	vere col ling ou	lected at the 20"	the shale sh casing shoe.	aker at 10 f	t. interv	als
(ii)	Coring :					•	
	No cores w	ere tak	en.				
(iii)	Side wall	samplin	g :				
	A total of A detailed	90 sam list i	ples were t s given in	tried, of wh appendix 5.	ich 85 were 1	recovered	ø

LOGGING AND SURVEYS

(i) Electric logs :

1ES/SP		37081-21901	9	2226'-952'	
FDC/GR	8	3708'-2190'	ç	2226'-952', GR to 350'	
CNL		3708.1-21901		0	
BHC	e e	3699'-2190'		2226'-952'	
HDT	0 9		•	2223'-952'	
ML/MLL		3703'-2190'	7		
Velocity survey					

(ii) Penetration rate and gas logs :

Recorded by Baroid, ADT-unit. A continuous record of gas in the mud was kept using a Hot Wire Detector and Gas Chromotograph from the 20" casing shoe to total depth.

(iii) Deviation surveys :

Totco	recorders	were used.	
Depth	972 ft,	Deviation	10
**	1258 ft,	88	10
18	2230 ft,	19	40
88	3703 ft,	Ŷ1	10

(iv) Temperature surveys :

A temperature survey was run to detect the top of the cement behind the $10\frac{3}{4}$ " casing.

Top cement was found at 630 ft.

6. <u>TESTING</u>

Eight runs were made with the Schlumberger formation interval tester. Gas was recovered from 2673 ft. and 2695.5 ft. For details see appendix 7.



5.

SHELI	DEVELOP	MENT	AUSTRI	ALIA) P	TY LTD	PFRMI	T VIC/P9		WELL ;	Sol Nol			
10%	KLY DRILL			Performance and a second s		27/1 10	nun ineneriste index endisiste andona sub	AIG G	LOMAR CON	C			
R. T. F	Elevation 2	32 hei	beve MSL			ON OWNER AN A CONTRACT OF THE OWNER OF THE OWNE	CAI	SING	ANTO AN LOCKTON AND AN AND AN AND AN AND AND AND AND A	NET OF LEAST STREET, STORE ST.			
Sea Bo	ntom Depth 42	23 ftb	elow MSL	, ,	Size	30"	20"	Contractor of Contractor of Contractor					
V V					Depth	4751	9521		A.SING Manager Late Composition and the second state of the second				
<u> </u>	DEPTH		MUD			an ourserserverenes			et sambasid konsecutionakonakonakonako	Access managements and			
DATE	(PROGRESS) (feet)	Weight (Ib/gal)	(MF secs)	Wateriosa (cc/30 mina) Ci (ppm)			OPER	ATIONS					
77/4				Al Chinese	Dia rol	lassad to	- Shall on	27/1/1973	o+ 1700 h	AHTS .			
27/1						<u>Rig released to Shell on 27/1/1973 at 1700 hours</u> . Moved rig to location Sole.							
							ations due		ther.				
28/1	700	8.8	75	noppin	6	Ran anchores 7, 2, 5 and 10. Positioned vessel.							
	(245)	100) averation		a to an an an an an an	Ran and	chors 3,	4, 8 and 9	•		000 11			
		autocontra th		-	Tested anchor Ran gui	Tested anchors 2, 3, 4, 5, 7, 8 and 9 to 200,000 lbs. anchor 10 to 180,000 lbs.							
				•									
			-	Careford Process	Spudded	l in Sole	t + 36" hol e No. 1 on	28/1/1973	at 23.00	hours.			
					Co-ordi Lat.	inates :-	_ 38° 07' 00	-836" S					
					Long.	. 1	149° 02' 04						
						r Depth: 3 36" ho	423 le to 500 f	۱ 4					
					8		with mud.		a surrow of the state of the st				
29/1	972	8.8	75		n a construction of the second		le to 972 f	't.		· · ·			
	(272)				Ran 20'	" casing	with mud. , X-52 LP,	91.51 lbs,	/ft and pi	le joir.			
	n				Instal	led guide	e-frame in ing at 952	moonpool.					
					Cemente	ed same w	with 1,100 nt "N" + 2%	sacks Ceme	ent "N" +	s - t .			
à	- Alterio - A		and a second		15/6 11	bs/gal.) Vavie 27	100 y weign	. 0			
		er solt til til som					t surface. led to take	e test pres	ssure of 5	000 PSI			
30/1	972		-		Kept sl	hear ram	s in Shaffe	er and ins [.]	talled bli	nd-rams			
<i></i>	()				in post	ition of	upper-pipe Tested ram	e rams in t	triple Can				
					Ran BOI	P's and :	riser.						
•					Made ol	bservati	ack over on on dive.						
			_		Turned	stack a	nd landed o	m all guid	le-posts.	an ann an an an an an an an			
	•			çanı bonun anı anı anı anı anı						x			
				C 401	-								
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RTF	levation 3	52 ft a	bove MSL					CASING					
	ttom Depth				Size	30"	20"				1		
					Depth	475	952				1		
en internet av et talen internet		an a	MUD	n a sanaga yang bang da balan (1979) a sanag	Deptn	-717							
DATE	DEPTH (PROGRESS) (feet)	Weight (ib/gei) pM	Viscosity (MF secs) oil (%)	Waterioss (cc/30 mina) Ci (ppm)		9000 JUL & #71100.0000 00		OPERATION		and all and a state of the second state of the	0.000000000000000000000000000000000000		
31/1	1258 (286)	Sea	vater		Teste Teste equ	d casir d BOP's ipment	, choke	ollet co and ki	onnector Ll-lines	r to 500 and su led wear	rfac		
					Ran i Top c Drill out lea	ement a ed out ting re king ri	turns a .ser sli	t. Drille s from 1 pjoint.	1180 ft.	258 ft.) , due t ched ris	0		
					and	replac	ed pack	ing.					
1/2	2230 (972)	9.0 10.6	38	7.0 3,000	Teste Ran i Made	d kill n with checktr	and cho 134" bi rip to 1	ke line: t and d: 200 ft.	s to 500 rilled t Pulled	:0 2230 : 1 out.30	ft.		
THE REAL POINT OF THE POINT OF					Made checktrip to 1200 ft. Pulled out.30,000 lb overpull from 1200 ft. to casing shoe. Ran IES. Unable to pass 980 ft. Ran in with bit. Reamed 980 - 1075 ft. Circulated and conditioned mud.								
2/2	2230	9 .0 10.6	38 -	7.0 3000		dout d:IE BH		2226' - 2226' -	952'				
						FI HI CS	т :		o 450' 952' ed 29				
							bit. C .ed out.		ed and c	onditio	ned		
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WELL: SOLE NO.1

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WEEKLY DRILLING TIME BREAKDOWN FROM 27/1/73 TO 2/2/73

OPERATIONS	27/1	28/1	29/1	30/1	31/1	.1/2	2/2	WEEKS TOTAL	CUM TOTAL
(0) <u>PREPARATION</u>	l	. y a							1
MOVING IN/OUT	. 6	· · ·						6	- minimum
ANCHORING	11/2	$10\frac{3}{4}$, <u>,</u>				124	
WAIT ON WEATHER (MOVING)	51/2	<u>.</u>						51/2	
an managa di kalangan dan san ang di kang mang kanang mananan na sanananan mananan mananan sa sanana kanang ma	Second Coloma Second	SI	UB-TOTAI	L MOVIN	(;			234	
(1) DRILLING	l				1		•		Γ
DRILLING, HRS.ON BOTTOM	L	21	23		41	$8\frac{1}{4}$		181	
DRILLING, ROUNDTRIPPING		8	1.1		2 <u>1</u>	, 8	6 1/4	26	
DRILLING, MISCELLANEOUS		d.	1 4		L		1 4	12	
ENLARGING, REAMING						1			
CIRC., COND. MUD	Lamaian	4	3			3 <u>3</u>	1 1	6	
RUN CASING AND CEMENT			1112				3	141	
RUN AND TEST U.W.E.		21/2	1½	167	$8\frac{1}{2}$		1 1/2	304	
'ISHING		Jane Contraction (State State Stat			!				
DIVING								T	T
	nijenjever takon ja territore da	S	UB-TOTA	L DRILL	JNG			97	
(2) <u>EVALUATION</u>					'	ĺ . !	•		
CORING, HRS ON BOTTOM		and the Date of Date of the Da							
CORING, ROUNDTRIPPING									L
CORING, MISCELLANEOUS	Charles Marine Sciences							I	
LOGGING						12	117	13‡	
WIRE LINE PM. TEST									
ROUNDTRIPS								T	
		S	UB-TOTA	L EVALU	JA'TION	det territolenen		·13 ¹ /4 .	
(3) <u>COMPLET ION</u>						1			
INSTALL, PROD. TEST EQP.									
PRODUCTION TESTING									
COMPLETION									
		S	SUB-TOTA	L COMPI	LETION				
(4) SUSPEND/ABANDON						· ·		I	
######################################			ITR-TOTA	1. SUSPJ	END/ABA	NDON			
MISCELLANEOUS* REPAIR DRAWWORKS									
REPAIR ENGINES/GENERATORS		and the second s							
REPAIR PUMPS									
REPAIR U.W.E.			6 (1)	74 (1)	$8^{2}_{4}(1)$	1(1)		23	1
REPAIR TV, GUIDANCE					Call Short and				
REPAIR MISCELLANEOUS									
WAIT ON WEATHER			1		And 100	1			
WAITING, OTHER	1		•						daan amaa ahaa midaa dada ahaa ahaa ahaa ahaa ahaa ahaa
Miliotheliciteletrostructure) natures the sum of the su	60000000000000000000000000000000000000	S	SUB-TOTA	L OPERA	TING D	OWNTIM	normationalization	23	Easile Court also retain and an ann
			OTAL	·		••••	,	157	
•								TION TO	

CHEMICAL CONSUMPTION 27/1 TO 2/2 SOLE NO. 1.

Barytes	700	sacks	
Aquagel	676	80-	
Q-Broxin	64	98	
CC - 16	32	\$\$	
Soda-ash	7	88	
Caustic	9	drums	
•			

Cumulative

Cement			
Cement Class "N"	e 9	1504 sacks	
Calcium Chloride	:	12 "	

No.			Bit	S							
No.	Size	Type	Man	No.	Nozzles	Depth Out	Footage	Hours	Condition B-T-G	WOB 000 15	RPM
1	26#	OSC-3A	HTC	LN-131		500	45	11	1-1-I	10	60
RR	26"	OSC-3A	HTC	LN-131	10	972	517	61	1-1-I	10-20	150-180
2	133"	osc-3aj	IITC	KH-405	$3 \times 1\frac{1}{2}$	2230	1258	13	1-1-I	15 -30	125-200

	DEVELOP	nemenosis industriation interaction in		an a	from	PERM: 3/2 10		C/P9	16 GLOMA	WELLS R CONCE			
	levation		bove MSL					CASING		AL OCTORE TO A CONTRACTOR MANAGEMENT	******		
		423 ft b			Size								
					Depth	475'	952'	2199'		A CONTRACTOR OF CONTRACTOR			
DATE	Depth (Progress)	Weight (Ib/gai)	COMPANY OF THE OWNER OF THE OWNER OF	Weterlose (cc/30 mine)	OPERATIONS								
3/2	(feet) 2230 ()	pH 10.3 10.6	oil (%)	CI (ppm) 6.0 4100	2199 f [.] Cement follow prehyd: neat c	<pre>2" casing t. ed with ed by 23(rated) 1 ement, 1 casing</pre>	250 sack 0 sacks 2.3 lbs/ 5.6 lbs/	s neat gel cem gal, fo gal.	cement, ent (3% llowed b Full ret	15.6 lb Bentoni by 200 s turns.	s/ga te B acks Pres		
•					Tested in wit format	mperatur seal as h $9\frac{7}{5}$ " bi ion grad 8 lbs/ga	sembly a t. Dril ient tes	ind BOP' Lled out	s to 140 cement.)O psi. . Made	Ran		
4/2	3611 (1381)	10.8 10.5	45 -	4.8 4700	2706'. and ci	Hydroc rculated	arbon sl at eacl	nows in n connec	mud. Ma	ide flow	-che		
5/2	3703 (92)	10.7 10.5	46	3.8 5000	 O 2706'. Hydrocarbon shows in mud. Made flow-checks and circulated at each connection. Drilled to 3360' Made check trip to shoe. 8 Drilled to 3703'. Circulated. Made check 								
6/2	3703 (10.7 10.4	44 -	3.9 5000	Ran FI FI FI FI	ound tri T-1 at 3 T-2 at 3 T-3 at 2 T-4 at 2 T-5 at 2	160', r 160', r 2728', r 2727', r	ecovered ecovered ecovered	1 1000 1 22000 1 22000	cc mud (cc mud. cc mud.			
					Line Carpone South States and States			•					

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WEEKLY DRILLING REPORT No. 2 fees 3/2 bu10/2/73 MEDLIAMAR CURCE :10N R 7, Elevation 22 fsabore MSL GARMAC See Botten Daph 423 h below MSL Site 30 ⁿ 20 ⁿ 10 ¹ /2 ⁿ nare genome au 00 Site 30 ⁿ 20 ⁿ 10 ¹ /2 ⁿ 10 ¹ /2 ⁿ nare genome au 000 Site 30 ⁿ 20 ⁿ 10 ¹ /2 ⁿ 10 ¹ /2 ⁿ nare genome au 000 Site 20 ⁿ 10 ¹ /2 ⁿ 10 ¹ /2 ⁿ nare genome au 000 Site 2199 ¹ 10 ¹ /2 ⁿ 10 ¹ /2 ⁿ	and the second	ances and and and	DEVELOP	**************************************	cup, comoestabaixaixaaga	ana na sana ang sana ang sana sana sa	an a	name usamanana wiiwan	IT: VI	stansation + ester	107 403 4 107 1 0 10 10 10 10 10 10 10 10 10 10 10 10	and and the second s	No.
See Bottom Depth 423 ft below MSL Size 30" 20" 10½" Depth Depth Depth 475' 952' 2199' DATE DEPTH (PROGRESS) MUD (Wight) Weight (Wiscall (c020 mma) OPERATIONS 7/2 3703 10.7 44 3.9 FIT-6 at 2791', recovered 22000 cc mud. 7/2 3703 10.4 - 5000 CST : 2 guns, recovered 56. FIT-7 at 269515', recovered gas, see test report. FIT-8 at 2729', recovered 22000 cc mud. Ran in open-ended. Set cement plug 2850'-1858'. Weight tested cement with 10,000 lbs. Set cement plug 700'-505'. 8/2 3703 Disconnected bell nipple. 9/2 Bisconnected bell nipple. 9/2 Ran explosive chage on drill pipe and detonated 24 't. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs. Abandoned Sole No. 1 on 9/2/73 at 14.30 hours.		WEEK	LY DRILL	ING RE	PORT	No. 2	from (3/2 \$01	10/2/73		HIG GLOMAS	2 CONCE:	CON
Depth Depth 475' 952' 2199' Date Depth 475' 952' 2199' Date Depth Wolph (Model) With memory (MF energy) (MF energy) Correction memory (MF energy) OPERATIONS 7/2 3703 () 10.7 44 3.9 FIT-6 at 2791', recovered 22000 cc mud. CST : 2 guns, recovered 56. FIT-7 at 2695:5', recovered 22000 cc mud. Ran in open-ended. Set cement plug 2850'-1858'. Weight tested cement with 10,000 lbs. Set cement plug 700'-505'. 8/2 3703 (PB to 505') Disconnected bell nipple. Pulled marine riser and BOP stack. Retrieved anchors 1, 3, 4, 6, 8 and 9. 9/2 Ran explosive chage on drill pipe and detonated 24 ft. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs.		R.T. EI	levation	32 ft al	oove MSL	1		and the second	a a a a a a a a a a a a a a a a a a a	CASING	nije u sekola obsekla na kola ostalovena gode	an a	and the second
DATE DEPTH (PROGRESS) MUD (Weight (bb(gei)) MUD (Viscouit) (MF seeb) OPERATIONS 7/2 3703 () 10.7 10.4 44 3.9 5000 FIT-6 at 2791', recovered 22000 cc mud. CST : 2 guns, recovered 56. FIT-7 at 2695;5', recovered 22000 cc mud. Ran in open-ended. Set cement plug 2850'-1858'. Weight tested cement with 10,000 lbs. Set cement plug 700'-505'. 8/2 3703 (PB to 505') Disconnected bell nipple. Pulled marine riser and BOP stack. Retrieved anchors 1, 3, 4, 6, 8 and 9. 9/2 Ran explosive chage on drill pipe and detonated 24 't'. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs.	(V)	See Bot	tom Depth 4	123 h bi	alow MSL		Size	30"	20"	10 🖥			
DATE DETH (H)GGRESS) (Vest) Weight (U)gel) Viscosity (MF sees) Waterics (cc/30 mins) OPERATIONS 7/2 3703 (-) 10.7 44 3.9 FIT-6 at 2791', recovered 22000 cc mud. 7/2 3703 (-) 10.7 44 3.9 FIT-6 at 2791', recovered 56. FIT-7 at 269515', recovered 22000 cc mud. Ran in open-ended. Set cement plug 2850'-1858'. Weight tested cement with 10,000 lbs. Set cement plug 700'-505'. 8/2 3703 (PB to 505') Disconnected bell nipple. Pulled marine riser and BOP stack. Retrieved anchors 1, 3, 4, 6, 8 and 9. 9/2 Ran explosive chage on drill pipe and detonated 24 't'. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs.						117 - 201	Depth	475'	952'	2199'			
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 (-) 10.4 - 5000 CST : 2 guns, recovered 56. FIT-7 at 2695!5', recovered gas, see test report. FIT-8 at 2729', recovered 22000 cc mud. Ran in open-ended. Set cement plug 2850'-1858'. Weight tested cement with 10,000 lbs. Set cement plug 700'-505'. 8/2 3703 (PB to 505') 9/2 9/2 Ran explosive chage on drill pipe and detonated 24 ft. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs. Abandoned Sole No. 1 on 9/2/73 at 14.30 hours. 		DATE		(Ib/gel)	(MF sace)			annanganga (atti de canadara (at	an tu nyap managang panagang ang ang ang ang ang ang ang ang	07 630 87 9 1 9 - 9		QQAREERTSSTUK MEN KANNANAN	Allows Schmanzowskiege at
8/2 3703 (PB to 505') 9/2 Band explosive chage on drill pipe and detonated 24 it. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs. Abandoned Sole No. 1 on 9/2/73 at 14.30 hours.	7/	12	s	8 1	1	5000	CST : 2 FIT-7 a	guns, 1 t 2695	recovere 5', reco	d 56. vered g	as, see	test rep	p ort .
(PB to 505')Pulled marine riser and BOP stack. Retrieved anchors 1, 3, 4, 6, 8 and 9.9/2Ran explosive chage on drill pipe and detonated 24 it. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs. Abandoned Sole No. 1 on 9/2/73 at 14.30 hours.							Ran in Weight Set cem	open-end tested d lent plug	ded. Sø cement w g 700'-5	t cemen ith 10, 05'.	t plug 2	850'-185	581.
24 it. below seabed. Retrieved well head, guide frames and pile joint. Max. pull 350,000 lbs. Abandoned Sole No. 1 on 9/2/73 at 14.30 hours.			(PB to				Pu lle d Retriev	marine 1 ed ancho	riser an ors 1, 3	d BOP s, 4, 6,	8 and 9	pe spoense service of the service of	
Rig released to Esso on 10/2/1973 at 04.00 hours.		312					24 it.	below so	eabed.				
							Max. pu	11 350,0	000 lbs.				
							Max. pu Abandon	all 350,0 and Sole	000 lbs. <u>No. 1 o</u>	on <u>9/2/7</u>	3 at 14.	30 hours	S_0
							Max. pu Abandon	all 350,0 and Sole	000 lbs. <u>No. 1 o</u>	on <u>9/2/7</u>	3 at 14.	30 hours	S_9
							Max. pu Abandon	all 350,0 and Sole	000 lbs. <u>No. 1 o</u>	on <u>9/2/7</u>	3 at 14.	30 hours	S_9
							Max. pu Abandon	all 350,0 and Sole	000 lbs. <u>No. 1 o</u>	on <u>9/2/7</u>	3 at 14.	30 hours	S_9
							Max. pu Abandon	all 350,0 and Sole	000 lbs. <u>No. 1 o</u>	on <u>9/2/7</u>	3 at 14.	30 hours	S_0
i i i i i i i							Max. pu Abandon	all 350,0 and Sole	000 lbs. <u>No. 1 o</u>	on <u>9/2/7</u>	3 at 14.	30 hours	S_9

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CHEMICAL CONSUMPTION 3/2 TO 9/2 SOLE NO. 1.

		Cumul	ative
Barytes	1700 sac	ks 2400	sacits
Aquagel	60 "	736	19
Q-Broxin	105 "	169	85
CC - 16	86 "	118	19
Soda-ash	9 "	16	÷:
Caustic	9 dru	ms 18	drums

<u>Cement</u>

Cement	Class "1	19	1430	sacks
Calcium	Chlorid		1	sack

			<u>Bits</u>								
No.	Size	Туре	Man	No.	Nozzles	Depth Out	Footage	Hours	Condition B-T-G	WOB OUO lbs.	RPM
3	9 8 "	X-3AJ	HTC	21064	3 x ½	3703	1473	204	3-8-7	20-40	150

WEEKLY DRILLING TIME BREAKDOWN FROM 3/2/73 TO 9/2/73 OPERATIONS WEEKS CUM 3/24/2 5/2 6/2 7/2. 8/2 9/2 TOTAL TOTAL 1501 (O) PREPARATION di pîrar \mathcal{I}_1 $\frac{1}{2}$ MOVING IN/OUT 1 13불 13늘 19号 . ANCHORING $A_{i,j} = A_{i,j}$. 4. 121 n, sta WAIT ON WEATHER (MOVING) 51/2 SUB-TOTAL MOVING ۰. 13불 371 (1) DRILLING DRILLING, HRS.ON BOTTOM 18 21 20% 38-2 DRILLING, ROUNDTRIPPING 1.1. 21 31 ÷ 67 327 DRILLING, MISCELLANEOUS <u>1</u> 21 31 32 . . ENLARGING, REAMING ę 1 CIRC., COND. MUD 11 11 '4 63 121 RUN CASING AND CEMENT $g \in \mathcal{T}$ 14 . 1 14 281 RUN AND TEST U.W.E. 1 Maky . 41 · , , ' . , i 41 35 F 100 DIVING 5.5 , Ê. 141 SUB-TOTAL DRILLING 152 55 And a second sec e Paris i ser Sin di ser Sin di serie di serie di serie (2) EVALUATION łt ί, ۰. Ъ Ца 1.1 CORING, HRS ON BOTTOM CORING, ROUNDTRIPPING k_{j}, q_{j} Negl 4 1.5 CORING, MISCELLANEOUS 1, et . 1 1 61 LOGGING Þ. à i 1.114 17 51 ı, 221 351 WIRE LINE PM. TEST 54 Έ. Έγ 14 131 13 . 261 261 ROUNDTHIPS 11 ្រ 51 51 51 SUB-TOTAL EVALUATION (3) <u>COMPLETION</u> TALL, PROD. TEST BOP. و به ا 1 1 PRODUCTION TESTING COMPLETION Maga . SUB_TOTAL COMPLETION , p. (4) SUSPEND/ABANDON . 1 11 151 - 81 35 351 ALTE-TOTAL SUSPEND/ABANDON 351 MISCELLANEOUS 1. 1 REPAIR DRAWWORKS a tra t F REPAIR ENGINES/GENERATORS REPAIR PUMPS $_{\rm H} > 4$ HAPAIR U.W.N. 23 HAPATH TV. QUIDANCH REPAIR MINORILANEOUS WAIT ON WEATHER 11, WAITING. OTHUR/STRIKE 81(4) 81 81 SUB-TOTAL OPERATING DOWNTIME 81 311 a + , <u>∔</u> + $[a_{1},a_{1}]$ TOTAL 323 166 . . . * THE NUMBER BETWEEN BRACKETS AFTER THE HOURS SHOWS THE ALLOCATION TO HEMARKS : PREPARATION (0), DRILLING (1), ETC. 1 . . .

 x^{1}

CEMENTATION REPORT No. 1

	D. 1				29/1/73	an a	ala kantanganan diangana
PURPOSE OF CEMENTA		:Ement 20" -	CASING	TO SEA	BED	* •	
CASING ASSEMBLY				•	•	÷	
Joints	15 / fz.	Grade	Rı	ungo	foint Nos.	DEPTH -	FEET
#259###2558#############################			-			From	To
1 X 30" ·	310	1 " WT) PILE JOINT	445	475
1 X 20"	154.2	X-52 LP			\$	445	478
1 X 20"	154.2	X-52 LP			CROSSOVER	478	522
10 X 20"	91.51	X-52 LP	ar		1 - 10 .	522	952
atralizer Depths	908"		Į				an a
AccessoriesDI	RILLPIPE STI	NGER TO 936	rr.			αδιατικ φάλα από ματά το	
R/	M CASING ON	DRILLPIPE					
	and a state of the						
G			•		•••		
EMENTATION	•	•	•			ether and an and a second s	an the content of the part
Cement used At	ıstralian Cl	ass "N"	·	Income No		•	· •
. Quantity used <u>14</u>							
Additives						BBL	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
Average slurry weight	•						and a second
Mising time				-			6
Loading plug							
. Chasing							
Displacement volume,							· .
Chasing pressure ; init	lal 400	augusta wa mananana ka su ka	psi.	Anal		600	
Recurns	To sea	bed	T BURGE WALLAST DATE OF	Losses	No indicatio	on of losses	•
Bumping pressure	0515		psl.	Gelefetti an angerapsikaan en apr			
Total time		61	mins.	Coment In	i placa21_0	<u>)4</u>	
emarks	· · · · · ·	•	•	•			
Top plug	•		feet,				
Pressure tests	500 PS	T.	•				
Drilled shoe siter			hrs.	1997 Andrew Berner Maldander La Pres	1979 - Carl Paris, Carl State, Car	ta dina mangangangkan dingkan dina kangan di pang	i in the second s
		43			Seat	bed	F
Top coment : (TS)			6 40 60 60 fc	And 1 (An 60 1 (C C C C C C C C C C C C C C C C C C	C		

CEMENTATION REPORT No. 2.

	0. 1 Comont	10211			3/2/73			
PURPOSE OF CEMENT	ATION <u>Cement</u>	107" Casi	ng to	200 It. 1	nto 20" ca	sing		» الألف، سوي والي بن عرب الع
foints	16 / ft.	Grade	R	enga	Joint Nos.	DE	PTH - FEET	
₩₩₩ ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩		ala ya kutoka na mata n				From		Te
46	40.5	J 55		3	1 - 46	451	2	2199

izandi katadaso da kang kang kang kang kang kang kang kan	·		1		ĸĦ₩₩₩₩Ĩ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩			1999 199919991999199919991999
9395/9744428-98492-4944-00-494-0	+							12- مىر دۇرانىيات خىرەتلەرلىك
an Selected and a	and a second state of the second	A NO A DE LE D			• artail <u>tin</u> aaraataisaanaatainaa			notanononadilla
ntralizor Depens	2180, 2160,	2120, 2081	2042	. 903.	an and a second state of the second			
\ccessories	Bakar float	shoe at 219	99.		-			and a state of the
	Halliburton	float colls	arat	2160				partificiti Denis quil e d
				· .		<u>``</u>		
ý ý					· .		•	
EMENTATION	-							
Cement used Aus	stralian Class	1.M 1.		Indone Ma	•			
Quantity used25(~ . ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	an a	
Additives <u>None</u> -								
Averege slurry weight								
Mixing time	10 - 12	- 10	mins.	Mixing beein	2	. 9.43		6. et .
Lording plug								
Chasing								
Displacement volume.							n Mandard a Clana da Anna ann an Anna a	aller and all for the former of the former o
Chasing pressure ; init							1100	psl.
Returns	•			Losses	None			
Bumping pressure	1500		p sl.					
Total time	57		mins-	Cement in pl	aco		10.40	brs.
EMARKS		•	•			nen en		
Top plug	2160		feat.					
Pressure tests		· +- 3500 ·						
Drilled shoe siter		18-20-7300-	hrs.	ter oump	ng ping	1,017,000,000,000,000,000,000,000,000,00	DE-chronical de anno activitation de la company	n takén kanapatén pangané
Top coment : (TS)				esteulored		752		
U	anna ann an 1942 an 1963 anns anns anns anns an 1945 anns anns anns anns anns anns anns ann	***************************************	100.90	~41981076A	nan karta, nin minak managi atar na Garata mandak wa wa a	<u> </u>	an a	feat

CEMENTATION REPORT No. 3

URPOSE OF CEHENTA		NDON WELL	DA1			•	
CASING ASSEMBLY	set cem	ent plug	2850 -	[.] 1900 FT	o ·		
Joints	(b / fc.	Grade	R	.AE9	Joine Nos.	DEPTH	- FEEL
an a						From	To
	-				and the state of the		
• .							1
NUTRE CARL HONOR OF CONTRACT OF A CONTRACT OF C	·	State Stat	1		₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩		<u> </u>
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ctralizer Depths				and an and the states and the states and the states of the			
			1.11.12.000.001.000.000.0000.0000	and the second		an a standard a standar	
<u> </u>	 	·					
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ENENTATION				•			
SERTIATION	•	• .	•	•			•••
Cement used A					1989		WERE CONTRACTOR AND
Quantity used <u>6</u>	· · · ·		•				
Additives <u>N</u>						L	·
Aversge slurry weight			د مد سور الاردو ، د مار می الارد .	. Holson fex	22 ¹⁰	anna an	
Mixing time					()5 (
Lording plug						garmaniya almariyati matan dadi kulla dadi antari kang ang bagan	ara-ana manana any kaominina mangkao
Chasing						nementan ananakanang dentakan manananan anan	وريباور ومنده فيقوم والمحافظ والمحافظ والمحاف
Displacement volume, o Chasing pressure ; initi					₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩		
Returns <u>No Ca</u>	•			•			psl
Bumping pressure				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	stop		
Total time					AA		bri
MARKS		****			Construction of the second sec		
Top ystug	1959	•	feat.	·			
Prossure tests							
Drilled shoe after		an a	hrs.	• • • • • • • • • • • • • • • • • • • •			Aparel Indonésia (Indonésia Anatoké ana panén dés
Top coment : (TS)				calculated			. Base
	cement With						
						<u>, , , , , , , , , , , , , , , , , , , </u>	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩

CEMENTATION REPORT No. 4

PURPOSE OF CEMENTAT	IONABANIO	N WELL, S	ET CEM	ENT PLUG				
CASING ASSEMBLY	and the second s		- 500			·····		
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	ana na mana na		T	an south the second second	an a		DEPTH -	ECCY
Joints	16 / fe.	Grade	Re	ngo	Joint Nos.		Pom	To
52899277292-93-19975729942020992942944294429449794994949494494	-	99999-100000000000000000000000000000000	+				-	
		a dan kara sa						
• .•		e contraction of the contraction						
			1					and the second sec
		<u>1997 - A.S. Martin, C. W. R. C. Martin, C. Ma</u>			elwenarawik - norstadwarke			an the second
entralizer Depths						03/*		
e1807/09			STATISTICS CONTRACTOR		a-archite date out the state	****		مەربىيە بەلەر ئېزىكى ئېزىكى ئەربىكى ئەربىيە بىرىيە بىرىيە بىرىيە ئېزىكى ئېزىكى ئەربىيە بىرىيە بىرىيە بىرىيە
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						•	· .	
EMENTATION		• .	•	÷.,		•		
Coment used Aus	tr. Class "N"	Ann falla di instanta antigata di Indonésia	and the second secon	Indens No.				1997, SJ. 2007, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997, 1997
Quantity used100	sacks	n ga aya an tan gifa a fa an si a ta an si ya a tan		Quality	•			: موجود المراجع
Additives2%_								
Aversge slurry weight							Harbeten der Marthagen Tallen, der all gemeiner abbei	
Mizing time	10	an fan de state ander de state	mins,	Mixing begin	38	0445.		
Louding plug			mins.	فمتعاوين معال وجريتهم والمتحافظ والمعاور	and the state of the second state			the state of the second second
. Chasing	3	****	mins.	Chasing fluid	j			
Displacement volume, c							a de antiquesta de la constante	and the first of the second
Chasing pressure ; initia	al		pil.	Anal				P
Returns		n ja Bern die Heffelige Antonio ander state ander son		Losses	nationiniaes decadementaliticionea			ala an an Caracteric Charles and a sub-
Bumping pressure	Cala An Quant Angeler and a second state and the Angeler and the Angeler and the Angeler and the Angeler and the Ang	hormon and a shife Department	psi.		1		an a	a ya kata mana kata kata kata kata kata kata kata k
Total time		Davien Web (The objectively Company) and a	mins.	Cement in p	olaca	4.58		bi
EMARKS	•	•						
Top plug	505	aler den um 110000 (D-100 Mine) (publication)						
Prossure tests		1				فحر والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع والمراجع		Series dubies a Science de accesseurs acces
Drilled shoe after	••••••••••••••••••••••••••••••••••••••		hrs.					
Top coment : (TS)	678 5-5-6-5-6-5-6-5-6-6-6-6-6-6-6-6-6-6-6-6		fest,	calculated		Officers that has the second		fe
andressen metroditioner after voor after voor after bijden after after after after after after after after afte	۱۹۹۹ میروند. ۱۹۹۹ میروند میروند و اور اور اور ۱۹۹۹ میروند و اور اور ۱۹۹۹ میروند و اور اور اور اور اور اور اور اور اور ا		in a constant a star general de la constance de la companye de la				***	and the state of the
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TABULAR TALLY SHEET

Well: SOLE NO. 1

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Field: PERMIT VIC/P9

Date: 29/1/73

Pipe Size:- 20" CASING

CASING STRING SUMMARY

No. of Joints			Coupling	-		INTERVAL (K.B.)		
.1.(30")		l" WI	403	30	445 -	- 475)		
.1(20!!.)	156.2.	X-52LP	CIW-CC			. 478.)	PILE JOINT	,
.1(20".)		X-521P						•
10.(20r.)		X~52LP	CIN-3V	430		952		
Details and p	osition of C	ementing Acces	sovies:- BAKF	R FLOAT S	HOE AT 952 FT		2	
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Page 1 of 2

TABULAR TALLY SHEET

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Date: 3/2

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Page 2 of 2.

TUBULAR TALLY SHEET

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PALYNOLOGY

INTERPRETATIVE

APPENDIX 2 to WCR Sole-1

PALYNOLOGICAL REPORT ON WELL SOLE-1, OFFSHORE GIPPSLAND BASIN,

VICTORIA, AUSTRALIA.

By J.G. Wilschut

SUMMARY

All suitable sidewall samples in the Latrobe and Strzelecki formations intersected by well Sole-1 were investigated palynologically. The Latrobe group proved to be of an Eccene-Paleocene age, unconformably overlying the Strzelecki group, Albian in age in this well. No Upper Cretaceous dating could be proved although sediments of this age may be present between 3200' and 3355'.

1. INTRODUCTION

Palynological investigations were carried out in the interval 2665' to TD from which no microfaunas were recovered. Out of a total of forty three (43) sidewall samples taken in that interval only thirteen (13) could be selected as suitable for palynology. In addition a coal sample from 3190-3205' was selected from the ditch cuttings.

Detailed analyses were carried out by using types published by Cookson (Refs. 1-5), Cookson and Pike (Refs. 6 and 7), Dettmann (Ref. 9), Dettmann and Playford (Refs. 10 and 11) and Harris (Refs. 12 and 13). A number of type slides of Tertiary and late Cretaceous sporomorphs, on which a publication is in progress by the Royal Society of Victoria and which are already available at the National Museum of Victoria, were also studied (Ref. 14).

For Cretaceous sediments the zonation of Dettmann (Ref. 11) is used. In the Lower Tertiary section no published zonation could be referred to and only the Time-stratigraphic classification has been given.

The samples analysed, together with their microfloral content and biostratigraphic and bio-facies interpretations are presented on a Distribution chart (Encl.3).

2. MICROFLORAL SUBDIVISION

Generally speaking, samples proved to be rich in sporomorphs with the exception of 2917' and 3175'. The following subdivisions could be established:

a) 3365'-3690' Albian Coptospora paradoxa zone.

All samples determined to belong to this zone were taken in the Strzelecki group of sediments penetrated in this well. The zone was determined on the presence of restricted species as Contignisporites glebulentus and Pilosporites grandis, although the latter one was only identified in the deepest sample. A number of Species commencing their vertical range within this zone were noted, notably Appendicisporites distocarinatus, Cicatricosisporites cuneiformis and pseudotripartitus, Krauselisporites jubatus and majus and Laevigatosporites major. A few specimen of Tricolpites pannosus were observed in these samples. This species is supposed to start its range in a younger zone, overlying the Coptospora paradoxa zone (Tricolpites pannosus zone). However, some contamination of small angiospermous elements such as Triporates and Tricolporates was observed most likely due to mudfiltrate and it is believed that the species determined as Tricolpites pannosus have the same origin.

Slightly higher maturation levels were observed in this interval as compared with those noted above. This may indicate erosion of some Strzelecki sediments before sedimentation resumed during Paleocene times.

INTERPRETATIVE

b) 2791'-3200' Paleocene

Microfloras observed in this interval closely resemble those described by Harris (Ref. 12) from the Princetown area as belonging to his Triorites edwardsii Assemblage zone. Dacrydiumites balmei, restricted to the basal beds of the Pebble Point Formation occurs throughout with the exception of the coal sample at 3200'. Gambierina edwardsii was found from 2917' downwards and occurred in high frequencies in the coal. Duplopolis orthoteichus is absent. The absence of types characteristic of Dettmanns 'Nothofagidites microflora' such as Nothofagidites senectus and Tricolpites sabulosus from the coal at 3200' would favour a Paleocene age for it. A few species also believed restricted to the 'Nothofagidites microflora' such as Proteacidites amolosexinous and Tricolpites pachyexinus were found higher in this interval. However, in sample 3093' a specimen of Deflandrea speciosa was found which is restricted to Paleocene sediments.

The presence of the Triorites edwardsii/Duplopollis orthoteichus Concurrent range zone of Harris could not be established.

Between 3200' and 3365' no suitable sidewall samples are available, and the presence of the 'Nothofagidites microflora' of Upper Cretaceous age could thus not be determined.

c) 2665' Eocene

The highest sample belonging to the Latrobe group contains a microflora which differs from that described before. It consists of species described by Harris as belonging to his Duplopollis orthoteichus Assemblage zone, such as Duplopollis orthoteichus, Tiliaepollenites notabilis, Myrtaceiidites eugenoiides Proteacidites dilwijnensis and pachypolis. Harris assigned a Paleocene (Upper) to these microfloras. In a lecture given during the Anzaas congress in May 1971 on the stratigraphic palynology of the offshore Gippsland basin (unpublished) Evans indicated the Eocene/Paleocene boundary at the first occurrence of Duplopollis orthoteichus. It is of interest to note a marked increase in Nothofagidites in the higher part of the Latrobe group in this well.

3. **BIOFACIES INTERPRETATION**

In both the Latrobe and Strzelecki group of sediments no microfaunas were recovered, indicating a non marine depositional environment. In palynological preparations however, a few microplankton specimen were observed. This could indicate marginal marine conditions for these samples. No detailed identification of depositional environments by means of sporomorphs has been attempted for lack of more data on the basin and the entire interval has been classified as continental/transitional.

J.G. Wilschut

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ASIN GIPPSLAND BASIN DATE December 4th, 1974

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ELL NAME SOLE-I

ELEVATION _____

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	<u>N. senectus</u>											
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BASIN <u>GIPPSLAND BASIN</u> DATE <u>December 4th, 1974</u> ELEVATION

ELEVATION

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PALAEONTOLOGY

INTERPRETATIVE

APPENDIX - 1

SOLE-1

PALAEONTOLOGICAL REPORT

by M. Apthorpe

Melbourne

May 1973

Introduction.

This report presents an analysis based on foraminifera of the upper part of the Sole-1 well, in the Gippsland Basin, Southern Australia. The interval 1015 feet to 2657 feet was sampled by 41 sidewall cores, of which 32 were used in this analysis. Some samples were not examined because of severe diagenesis.

Acknowledgements.

The writer is indebted to David J. Taylor, consultant to Esso Exploration Ltd., for biostratigraphic advice and guidance on the environmental interpretation of the fauna, based on his work on the Gippsland Basin.

The Foraminiferal Sequence.

Summary.

Sole-1 intersected 1660 feet + of the Gippsland Limestone Formation before reaching the unfossiliferous Latrobe Group. In this well the Gippsland Limestone is entirely of Middle Miocene age, in the sense of Shell. (The same interval is referred to the Upper Miocene by Taylor and Esso, who use only a two-fold division of the Miocene). The biostratigraphic units intersected are zonules C, D-1 and D-2 of Taylor (1966, and unpublished).

The depositional environment of that part of the Gippsland Limestone intersected in this well is of an upward and outward building slope and shelf with progressive shallowing. Initial continental slope deposits are followed by thick deposits of a migrating submarine canyon, passing up into outer neritic and then middle neritic carbonate shelf sediments. The nature of the top of the sequence is concealed by the casing.

Biostratigraphy.

Zonule C (+1015' - approximately 1750').

The zonule is identified in this well on the presence of Globorotalia lenguaensis, which is sporadically abundant, together with Globorotalia miotumida. Longer ranging planktonic species occurring in the zonule include the Globorotalia miozea group, Globorotalia acostaensis, G. menardii, G. mayeri, G. panda, G. siakensis, G. bella, and Orbulina universa. Globigerinoides glomerosus circularis ranges up into this zonule; it has previously been reported only as high as Zonule D. The occurrence of Globorotalia siakensis in Zonules C and D-1 extends the known range of the species in Southern Australia considerably upwards. Globorotalia lenguaensis disappears about 150 feet above the base of the zonule (lowest occurrence at 1582 feet).

Zonule D-1 (approximately 1750' - 2150').

The top of the zonule is placed at the highest occurrence of Globorotalia conica. Specimens referable to Jenkin's species Globorotalia "mayeri barisanensis" occur just above this, at 1705', so that the top of D-1 could possibly be placed as high as 1705'. Other species present apart from those listed above are Globorotalia acostaensis (in the upper part of the zonule only) and occasional occurrences of Globorotalia peripheroacuta. Globorotalia miotumida and G. panda both disappear close to the base of the zonule.
Zonule D-2 (2150' - approximately 2650')

-2-

The top of the zonule is defined by the highest occurrence of Globorotalia peripheroronda in the sample at 2160'. Specimens close to Globorotalia peripheroacuta appear higher in the sequence, within D-1, but abundant specimens corresponding to the type of G. peripheroacuta occur only near the base of D-2.

Orbulina universa and O. suturalis disappear at 2538'. Older members of the Orbulina lineage, Globigerinoides transitorius and Globigerinoides sicanus (=bisphericus), do not appear until 2623', so that there appears to be a gap in the lineage. Since G. sicanus is the indicator species for the top of Zonule E, the interval between 2623' and 2657' is referred to the Zonule D - Zonule E boundary. Some workers may prefer to place the interval within Zonule E, but the numbers of Globigerinoides sicanus are not great, and Globigerinoides glomerosus glomerosus is conspicuously absent, so that a determination on the boundary is preferred here. Taylor (pers. comm.) has suggested that the disappearance of Orbulina above the base of D-2 may be due to environmental factors. He has indicated that changing water mass characteristics may have temporarily removed the Orbulina population from the Sole area at the time when O. universa was evolving.

Rare specimens of Globorotalia zealandica, which is normally found in Zonules F to H, may indicate reworking of older sediments into the Sole sequence. Reworking is supported by the presence of Oligocene microplankton species within the Miocene carbonate sequence. Cassigerinella chipolensis occurs in abundance at 2632¹. Its presence may be due either to reworking, or may be an extension of the local range of the species.

The form recorded here as Globigerina tripartita is the same as that referred to by Jenkins, and by Taylor, as Globoquadrina dehiscens advena.

All sidewall cores examined below 2660' were barren of foraminifera.

Environment of Deposition.

A. Comment on the faunas.

<u>Neritic (shelf) faunas</u> have been recognised by the abundance of the calcareous benthonic group, the Cibicidae, which make up 23% of the total fauna in the middle neritic samples. The species Cibicides cygnorum and Rosalina mitchelli, which are abundant, are confined to the shelf. The percentage of planktonic species rises from 50% in the middle neritic interval to 63% in the outer neritic.

<u>Canyon faunas</u> in general have a much lower diversity, particularly in the group of calcareous benthonic species, than either shelf or slope faunas. Two types of canyon fill are recognised here:

i) The upper part of the canyon sequence (1485' - 1918') is characterized by moderate planktonic percentages, and by high percentages of individual calcareous benthonic species which are spasmodically important, and then rapidly become insignificant in number. Cassidulina neocarinata is consistently abundant; Taylor regards it as indicative of high energy Shape and size sorting by currents or slumping appears to be conditions. an important factor contributing to the abundance of some species. ii) The lower part of the canyon sequence is extremely impoverished in all calcareous benthonic species, and the planktonic percentage rises to over 88% below 2400'. Arenaceous species are relatively more important than in the upper part of the canyon. The calcareous benthos includes small numbers of the most common slope species, presumably washed in. Conditions within the canyon appear to have been unsuitable for the survival of an in situ calcareous benthonic fauna. The only abundant



calcareous benthonic is Nonionella bradii. In the upper canyon this species is abundant only where Cassidulina neocarinata, the high energy indicator, is also at a peak. It is therefore possible that Nonionella bradii <u>may</u> be indicative of extremely unstable, turbulent, or high energy conditions within the canyon environment. The lower part of the canyon appears to have been a more extreme environment for fauna than the upper part, and there is a much greater ratio of sediment to fauna than elsewhere.

Slope faunas are recognized on a planktonic percentage over 60%, and a rich and extremely diverse benthonic fauna which includes deep water species. Some of the latter include: Melonis pompilioides, Planulina wuellerstorfi, Gavelinopsis lobatulus, Bucella cf. frigida, Euuvigerina picki (in a smoother slope morphology), Ramulina globulifera (one sample only), Reophax scorpiurius, Karreriella bradyi, Sigmoilopsis schlumbergeri, Vulvulina pennatula and Cyclammina spp. "Canyon" species such as Cassidulina neocarinata may also be abundant in slope samples. Some samples with transitional characteristics may represent the low energy edge of a migrating canyon, transitional to the slope.

B. The sequence of environments.

Slope (2651' - 2510').

At the base of the Gippsland Limestone carbonate sedimentation commenced on the upper continental slope. A flourishing deep-water fauna developed, but the presence of shallow water species (Carpenteria rotaliformis, Elphidium macellum), quartz and lithic fragments suggest transportation of material from the shelf. Reworking of older parts of the Gippsland Limestone is suggested by some of the planktonics and microplankton (see Biostratigraphy - Zonule D-2).

Lower "canyon and slope" interval (2500' - 1950').

The alternation of slope, canyon and transitional faunas suggests that one or more canyons migrated laterally across the continental slope in the Sole area during this interval. As already noted, environmental conditions within the canyon(s) appear to have been extreme, and the quantity of highenergy indicators within the intervening slope intervals suggests that the slope was also subjected to strong current activity, perhaps as a "spillover" from adjacent canyons.

Severe diagenesis has affected some sediments within the canyons. Channeling of solutions through the more porous parts of the canyon fill has resulted in heavy calcite cementation of some samples.

Upper canyon interval (1950' - 1450').

The later infilling of the canyon occurred under conditions more favourable to the development of an indigenous bottom living fauna. The abundance of Cassidulina neocarinata is interpreted by Taylor as indicating fairly high energy conditions throughout this interval. There are periodic population explosions of other forms - Bulimina costata and B. marginata, Epistominella exigua, Gavelinopsis lobatulus. Current activity may have strengthened at around 1705', where a percentage rise occurs in Cassidulina neocarinata and Nonionella bradii. (The latter is conspicuous in the more "hostile" lower canyon sequence). Sponge spicules are abundant in this interval.

Neritic (shelf) interval (1450' - 1015').

The canyon faunas pass upwards into deep outer neritic faunas below 1400¹. High productivity at the shelf edge produces a planktonic percentage over 60%, and a rich and diverse benthos in which no single species is dominant. The dominant group of the deeper water faunas, the Cassidulinids, are gradually replaced on the shelf by the Cibicidae. Sponge spicules are extremely abundant, particularly in the outer neritic environment.

No detailed analysis of the shelf faunas has been made, but the depth of

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water is seen to gradually shallow to middle neritic at the highest sample at 1015'. The foraminiferal populations show a gradual change, suggesting faitly stable conditions, in contrast to the violent fluctuations in populations observed in the lower part of the sequence.

Correlation of the local zonation with the Shell standard zonation.

Zonule C is correlated with the Globigerinoides subquadratus zone, based on the overlap of the ranges of Globorotalia mayeri and Globorotalia lenguaensis. The highest occurrence of Globorotalia mayeri defines the top of Zonule C in Victoria, and marks the top of Jenkins' G. mayeri mayeri zone in New Zealand. There appears to be some inconsistency between time ranges in temperate and tropical regions obvious here, as both Globorotalia acostaensis and Hastigerinella aequilateralis are present in Zonule C. Neither is reported by Postuma to range downwards so far.

Zonule D-1 is approximately equivalent to part or all of the Globorotalia fohsi (s.l.) zone, the G. lobata, and G. peripheroacuta zones of Postuma (1971). The top of the zonule cannot be precisely correlated with the standard zones because the top is defined on the appearance (=extinction) of two local species, Globorotalia conica and Globorotalia "mayeri barisanensis" (after Jenkins).

Zonule D-2 can be firmly equated with the Globorotalia peripheroronda zone of the standard zonation. D-2 is defined on the highest appearance of G. peripheroronda, and its base is defined on the highest appearance of Globigerinoides sicanus (=bisphericus).

Note on the distribution chart (Enclosure 2)

Because the washed residues of the sidewall cores consisted of thousands of foraminifera, conventional frequency symbols are not employed on the chart as they would generally be meaningless. A cross (x) on the chart indicates that the species was common to abundant (ie. tens to thousands of specimens present in the sample); a dot (.) indicates that the species was rarely seen during counting. A total of 200 to 1000 specimens were counted for each of the 24 cores quantitatively analysed.

References.

Jenkins, D.G. (1971)

Jenkins, D.G. (1960) Planktonic foraminifera from the Lakes Entrance oil shaft, Victoria, Australia. Micropal. v.6, no.4. New Zealand Cenozoic Planktonic Foraminifera. New Zealand Geological Survey, Paleontological Bulletin 42. Postuma, J.A. (1971) Manual of Planktonic Foraminifera. Elsevie Taylor, D.J. (1966) Esso Gippsland Shelf No.1: The Mid-Tertiary Manual of Planktonic Foraminifera. Elsevier, Amsterdam. Foraminiferal Sequence. Australia: Petroleum Search Subsidy Act; Publication no. 76.

SIDEWALL LORE PESCRIPHIONS

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SHELL DEVELOPMENT (AUSTRALIA) PTY. LTD.

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SIDEWALL SAMPLE DESCRIPTION

by

D. ELLENOR

DEPTH	NAME		LITHOLOGICAL DESCRIPTION
1015'	FOSSILIFEROUS MARL ' /	:	grey-green (5 GY/41), extremely finely crystalline, soft plastic with some hard steaks. finely disseminated pyrite common occurring as thin amorphous plates or lumps, trace finely granular glauconite as scattered grains; macrofossils abundant, cream white bryozoa sticks particularly common, some forams noted. CALCIMETRY: 55% CaCO ₃ , 45% CLAY nil porosity, clay non-swelling.
1075'	MARL	:	essentially as above; fossil debris minor sponge spicules noted, CALCIMETRY: CaCO ₃ - 52%, CLAY - 48%。
1130 '	MARL	:	As 1075', grey-green, soft, plastic non-swelling.
1165'	ARGILLACEOUS LIME MUD	:	As 1075', very small amorphous pyrite blebs and thin lamina quite prevalent; soft; sl. fossiliferous, sponge spicules, forams. CALCIMETRY CaCO ₃ - 74% CLAY -26%
1240'	LIME MUD	:	grey-green (5 GY/41) extremely fine to microcrystalline, soft, silt size to very fine grained glauconite and quartz grains scattered throughout, sparsely fossiliferous. CALCIMETRY CaCO ₃ >90% small pyrite blebs common;
1325'	FOSSILIFEROUS LIME MUD	:	as 1240'; finely comminuted fossil debris prevalent ; CALCIMETRY CaCO ₃ >90%
1410'	MARL	:	as 1075'. CALCIMETRY CaCO ₃ - 52%; CLAY - 48%.
1485!	MARL	:	as 1075'; very slightly sandy; forams noted. CALCIMETRY : CaCO ₃ - 55%; CLAY - 45%.
,1510 '	ARGILLACEOUS LIME MUD,	:	as 1165', slightly fossiliferous, very fine to extremely finely crystalline. CALCIMETRY: CaCO3 - 72%; CLAY - 28%.
1542'	FOSSILIFEROUS MARL	:	as 1015', grey-green (5 GY/41), soft, non-swelling, clay content high fossiliferous sponge spicules prevalent; pyrite flecks. CALCIMETRY: CaCO ₃ - 34%; CLAY - 66%.

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' <u>DEPTH</u>	ROCK NAME		LITHOLOGICAL DESCRIPTION
1582'	FOSSILIFEROUS CALCAREOU CLAY	S:	physical appearance as 1015'; fossiliferous sponge spicules, gastropods, forams noted; very clayey. CALCIMETRY : CaCO ₃ - 23%, CLAY - 77%.
1618'	FOSSILIFEROUS CALCAREOU CLAY	s:	as 1582' CALCIMETRY CaCO ₃ - 24%; CLAY -76%.
1650'	MARL	:	as 1075'.
1705'	FOSSILIFEROUS MARL	:	as 1015', fossils noted - sponge spicules, forams, pelecypod frags, unidentifiable micrcbioclastic hash.
ر پی ست ر ۲			CALCIMETRY: $CaCO_3 - 44\%$; CLAY - 56%.
1727'	FOSSILIFEROUS ARGILLACEOUS LIME MUD		:as 1165', minor pyrite, forams prevalent. CALCIMETRY: CaCO ₃ - 64%; CLAY - 36%.
1748'	MARL	:	as 1015', soft, plastic.
1775'	FOSSILIFEROUS ARGILLACEO LIME MUD	US	: as 1727; unidentifiable microbioclastic hash. CALCIMETRY: CaCO3 - 75%; CLAY - 25%.
1840'	FOSSILIFEROUS MARL	:	as 1015'; forams prevalent CALCIMETRY: CaCO ₃ - 50%; CLAY - 50%.
1857'	FOSSILIFEROUS MARL	:	as 1840'; sponge spicules and forams common. CALCIMETRY: CaCO ₃ - 50%; CLAY - 50%.
1918 '	CALCAREOUS CLAY	:	as 1582'; fossil content much reduced. CALCIMETRY: CaCO ₃ - 31%; CLAY - 69%.
1954 '	FOSSILIFEROUS CALCAREOUS CLAY	:	as 1582'; microbioclastic debris visible, sponge spicules and forams. CALCIMETRY: CaCO ₃ - 26%; CLAY - 74%.
1985'	CALCAREOUS CLAY	:	as 1582'; trace pyrite as flecks occasional silt size glauconite grains; no observable fossil detritus. CALCIMETRY: CaCO ₃ - 25%; CLAY - 75%.
2022'	MARL	:	as 1075'; occasional silt size quartz and glauconite grain; no observable fossil detritus. CALCIMETRY: CaCO ₃ - 41%, CLAY - 59%.
2055'	ARGILLACEOUS LIME MUD	:	as 1165'; slightly fossiliferous, sponge spicules and forams noted. CALCIMETRY: CaCO ₃ - 82%, C:AY - 18%.
2063'	FOSSILIFEROUS MARL	:	as 1542'; forams prevalent; trace pyrite. CALCIMETRY: CaCO ₃ - 35%; CLAY - 65%.
2078'	MARL	:	as 1075'; trace pyrite and glauconite; minor forams. CALCIMETRY CaCO ₃ - 63%; CLAY - 37%.

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DEPTH	ROCK NAME	LITHOLOGICAL DESCRIPTION
2130'	FOSSILIFEROUS MARL	: as 1015', sponge spicules prominent. CALCIMETRY : CaCO ₃ - 53%; CLAY - 47%.
2160'	MARL	: as 1075'. CALCIMETRY: CaCO ₃ - 41%; CLAY - 59%.
2195'	-	
2210'	FOSSILIFEROUS MARL	: as 1015'; forams prevalent. CALCIMETRY: CaCO ₃ - 38%; CLAY - 62%.
2289'	LIME MUD	: grey-green (5 GY/41), soft-crumbly silt size to very fine grained quartz grains scattered throughout, pyrite flecks and thin laminae common, sparsely to non-fossiliferous. CALCIMETRY: CaC03 > 90%.
2340'	MARL	: as 1075', no fossil debris noted. CALCIMETRY: CaCO ₃ - 63%; CLAY 37%.
2415'	ARGILLACEOUS LIME MUD	: as 1165', grey-green, non-fossiliferous scattered pyrite flecks, occasional silt size glauconite grains. CALCIMETRY: CaCO ₃ - 70%; CLAY - 30%.
2459 '	ARGILLACEOUS LIME MUD	: as 2415'. CALCIMETRY: CaCO ₃ - 64%; CLAY - 36%.
2510'	SANDY LIME MUD	: dark greenish-grey (5 G 1/4) soft- plastic fine sand size quartz grains abundant, some scattered pyrite; lime mud appears pelletoidal; sparsely fossiliferous sponge spicules present. CALCIMETRY: CaCO ₃ < 90%.
2538'	CALCAREOUS CLAY	: as 1985'; no observable fossil detritus. CALCIMETRY : CaCO ₃ - 33%; CLAY - 67%.
2574'	ARGILLACEOUS LIME MUD	: as 1240'; pyrite blebs and specks common; flaky texture. CALCIMETRY: CaCO ₃ - 86%; CLAY - 14%.
2595 '	FOSSILIFEROUS MARL	: as 1015'. forams abundant but no bryozoa sticks; scattered glauconite grains. CALCIMETRY: CaCO ₃ - 68%, CLAY - 32%.
2623'	ARGILLACEOUS LIME MUD	: as 2574'. CALCIMETRY: CaCO ₃ - 87%; CLAY -13 %.
2632'	LIME MUD	<pre>: as 2289'. silt-fine sand size quartz grains common sparsely fossiliferous trace pyrite flecks. CALCIMETRY CaCO₃ - >90%。</pre>

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DEPTH	\mathbf{R}	OCK	NAME	

LITHOLOGICAL DESCRIPTION

2642' FOSSILIFEROUS SANDY : as 2510'; fine sand-silt size quartz LIME MUD grains common; glauconite, some forams replaced by glauconite. : as 1542'; forams abundant some glauconite FOSSILIFEROUS 2644' grains, and silt size quartz detritus. MARL CALCIMETRY: CaCO₃ - 47%; CLAY - 53%. SANDY LIME MUD as 2510'; silt size quartz debris 2651' : abundant; sparsely fossiliferous, scattered glauconite grains. PYRITIC QUARTZ brownish-black (5 YR 2/1), fine-coarse 2665' : grained, loosely consolidated but with SANDSTONE hard streaks, mod. argillaceous, poorly sorted, pyritic cement, visible porosity strong petroliferous odour; moderate pale yellow fluorescence with mod.yellow fluorescent pinpoints and streaks; pale blue fluorescent streaks: pyrite cementation probably streaky. : light grey-white (N7-N9) fine-med. gr. QUARTZ SANDSTONE 2673' grains clear occasionally milky or smoky, no clay matrix, loose subang-subround; poor mod. sort, trace pyrite as coatings on grains; excellent visible porosity; moderate white fluorescence with mod. yellow fluor. pinpoints and streaks; pale blue white fluor. cut. 2681' QUARTZ SANDSTONE : as 2673', med. c. gr., weak even pale yellow fluorescence. SILTSTONE dusky brown (5 YR 2/2), micaceous, soft, 2682' : scattered silt size quartz grains; weak pale yellow fluor. cut. ARGILLACEOUS : light grey-white (N7-N9), med. gr., 2686' subang-subrnd, mod. sort. loose-friable QUARTZ SAND abundant clay matrix; weak spotty pale yellow fluorescence. PYRITIC QUARTZ : as 2665' with brassy yellow tint, med-c. 2697' SANDSTONE gr., subang., poorly-mod. sort, loosely cemented by masses of pyrite, weak pale yellow fluor. cut. as 2673'; unconsol., excellent visible QUARTZ SANDSTONE 2703' : porosity; very weak spotty pale yellow fluorescence. 2712' ARGILLACEOUS OUARTZ : as 2686'; f.-med. gr. well sort. unconsol., clay matrix, scattered pyrite flecks and SANDSTONE as coatings on some grains; strong even to slightly streaky yellow fluorescence; strong petroliferous odour.

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DEPT	H ROCK NAME		LITHOLOGICAL DESCRIPTION
2720	· QUARTZ SANDSTONE	:	as 2673'; well sorted, brown oil staining, very bright even to streaky yellow fluorescence, strong petroliferous odour.
2726	' QUARTZ SANDSTONE	:	as 2673', f. gr., scattered pyrite flecks, subang, mod- well sort.; streaky to even bright yellow fluorescence.
2734	' QUARTZ SANDSTONE	:	as 2673'; f-med gr., loose - friable, well sort., spotty to streaky bright yellow fluorescence
2742	QUARTZ SANDSTONE	:	as 2673'; med. gr., subrnd; strong, even bright yellow fluorescence.
2749	ARGILLACEOUS QUARTZ SANDSTONE	:	as 2686'; f. gr., well sort. white clay matrix, loose-friable; even bright yellow fluorescence.
. 2766	QUARTZ SANDSTONE	:	as 2742'; even to spotty bright yellow fluorescence.
• 2786	ARGILLACEOUS QUARTZ SANDSTONE	:	medium grey (N5), grains clear to smoky, f. gr., well sort, subrnd, loose - friable, pyritised black organic stringers and masses common,sl. argillaceous; spotty yellow fluorescence.
2791	' ARGILLACEOUS QUARTZ SANDSTONE	:	as 2786'; spctty yellow fluorescence.
2844	ARGILLACEOUS QUARTZ SANDSTONE	:	as 2686'; f. gr., well sort., white clay matrix; nil fluorescence.
2885	VERY SILTY SANDSTONE	:	dusky brown (5 YR 2/2), f. gr, subrnd, well sort, grains clear with brownish tint, visible porosity, slightly micaceous silty matrix; nil fluorescence.
2917	ARGILLACEOUS QUARTZ SANDSTONE	:	as 2686'; f vy. f. gr., subrnd well sort, loose - friable, visible porosity; nil fluorescence.
2934	ARGILLACEOUS QUARTZ SANDSTONE	:	light grey-white (N7-N9) with brownish tint, f c. gr., poorly sort, subang-subrnd, clay matrix.
3015	ARGILLACEOUS QUARTZ SANDSTONE	:	as 2934'; generally f. gr., poor - mod. sort, subang., loose-friable clay matrix.
3021	' SILTY QUARTZ SANDSTONE	:	as 2885'; f c. gr., loose friable poor sort, subang., poor visible porosity, brown silt to clay matrix.
3058	VERY ARGILLACEOUS QUARTZ SANDSTONE	:	as 2686; f. gr vy. f. gr., well sort, subïnd, friable, abundant milky white clay matrix; occasional pyrite fleck.
3070	QUARTZ SANDSTONE	:	light grey (N7), grains clear to colourless, f. gr., well sort, subind, friable, loosely compacted, good visible porosity; scattered small pyrite flecks.

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EPTH	ROCK NAME		LITHOLOGICAL DESCRIPTION
3093'	ARGILLACEOUS GLAUCONITIC QUARTZ SANDSTONE	:	greyish olive green (5 GY 3/2), f. gr., subrnd, well sort, friable, mod hard, argillaceous, f. gr., glauconite grains, abundant, pyrite flecks and blebs scattered throughout.
3112'	GLAUCONITIC QUARTZ SANDSTONE	:	greenish-black (5 GY 2/1), med - c. gr., poor sort., subang. mod. hard, silty, rock cemented by amorphous masses of glauconite; pyrite coats some smoky to clear quartz grains; no visible porosity; some pyrite cubes in glauconite matrix.
3114'	GLAUCONITIC QUARTZ SANDSTONE	:	as 3112'; pyrite masses abundant in places.
3156'	QUARTZ SANDSTONE	:	as 3070'; sl. argillaceous and micaceous, minor glauconite grains scattered throughout; quartz grains clear, smoky and milky, subang- subrnd, mod. sort.
3175 '	VERY SILTY, CARBONACEOUS QUARTZ SANDSTONE	:	greyish brown (5 YR 3/2), mottled colouration; fn-med. gr., subang, poor sort, pyrite flecks and coatings on quartz grains common; sl. micaceous; flecks and blebs of shiny black carbonaceous matter abundant; very silty to argillaceous; friable-mod. hard.
3178'	SILTY, CARBONACEOUS QUARTZ SANDSTONE	:	as 3175'; silt and carbonaceous not as abundant as in 3175'.
3235'	SILTY QUARTZ SANDSTONE	:	mottled dusky brown (5 YR 2/2), med-vy c. gr., subang, poor sort, friable-mod. hard, brown silt forms matrix, quartz grains clear to milky; minor carbonacecus blebs.
3276'	SILTY QUARTZ SANDSTONE	:	as 3235'; vy. poorly sorted, fvy. c. gr., white clay common, some glauconite grains and amorphous blebs; minor weathered pyrite flakes.
3318'	ARGILLACEOUS QUARTZ SANDSTONE	:	light grey (N5), fc. gr., poorly sort, subang. friable mod. hard; white clay matrix, grains colourless to milky; some visible porosity.
3339'	VERY SANDY SILTSTONE	:	light grey (N5), mod. hard, scattered f. m. gr., subrnd quartz grains.
3365'	CLAYSTONE	:	olive-grey (5 ¥ 4/1), chloritic, friable to moderately hard, slightly calcareous scattered fine silt size black flecks, (lithic fragments or pyrite flecks).
3367'	CLAYSTONE	:	as 3365'.
3403'	GREEN VERY SILTY QUARTZOSE SANDSTONE	:	dark greenish grey (5 G 4/1), f. gr., subang, very silty, green (chloritic?) to white matrix friable - mod. hard, well sort, pyrite flecks, carbonaceous blebs, sl. micaceous.; rock has distinctive greenish hue.

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DEPTH	ROCK NAME		LITHOLOGICAL DESCRIPTION
3433'	GREEN SILTY QUARTZOSE SANDSTONE	:	mottled dark greenish grey (5 G 4/1), quartz grains - med. gr., subang. predominant, black lithic fragments abundant, friable, porous, micaceous; glauconite grains common quartz grains clear, milky and rarely pinkish red.
3435 ^µ	GREEN SILTY QUARTZOSE SANDSTONE	:	as 3422'; lithic frags. and glauconite grains abundant.
3526'	GREEN, VERY SILTY QUARTZOSE SANDSTONE	:	as 3403'; f. gr., white clay-silt matrix abundant; sl. micaceous friable - mod. hard.
3608'	GREEN, VERY SANDY SILTSTONE	:	dark greenish grey (5 G 4/1), very f. gr., quartz, lithic and feldspar detritus abundant throughout; greenish (chloritic) matrix; mod. hard to hard; sl. micaceous.
3666'	CLAYSTONE	:	as 3365'; mod. hard - hard; sl. micaceous; very f. gr. quartz detritus scattered throughout.
3690'	CLAYSTONE	:	as 3365'.

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BASIC DATA

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SIDEWALL SAMPLES

SOLE-1

<u>RUN -1</u>

GAS CHROMATOGRAPHY

DEPTH(FT)

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9	
10	
11	
12	

SIDEWALL SAMPLES

SOLE-1

(<u>RUN -2</u>)

LATROBE COMPLEX FLUORESCENCE & GAS CHROMATOGRAPHY

<u>NO</u> .	LITHOLOGY	DEPTH	FLUORESCENCE	C ₁ (ppm)	C ₂ (ppm)
11	Coal	3182			
15	Siltstone	2923	-		
16	Sandstone	2850	-	0	0
17	Silty sandy	2798	Spotty yellow	400	100
18	Sandstone	2773	Even/spotty, bright yellow	0	0
19	Sandstone	2749	Even bright yellow	0	0
20	Sandstone	2728	Even/streaky, very bright yellow	250	100
21	Argill.sandstone	2720	Even/sl. streaky, very bright yellow	200	100
22	Pyritic, silty Sst	2706	-	50	0
23	Sand	2695	Weak,spotty, pale yellow	0	0
24	Brn. Siltstone	2692	-	200	100
26	Sst/siltstone	2683	Spotty, weak, pale yellow in sandstone	0	0
28	Marly sandstone	2662	-	0	0
36	-	3177	-	100	50
42	Argill.sandstone	2939	-	0	0
43	Sandy siltstone	2890	-	0	0
44	Argill.sandstone	2791	Spotty yellow	100	0
45	Sandstone	2755	Even bright yellow	50	0
46	Sandstone	2740	Spotty/streaky bright yellow	100	0
47	Argill.sandstone	2733	Streaky/even bright yellow	100	0
48	Sandstone	2710	Spotty, very weak pale yellow	0	0
49	Sand	2688	?	300	50
50	Pyritic, silty Sst	2673	Spotty yellow	0	0

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6-11-1986

SOLE-1

SWC RESIDUE

S.W.C. FROM 1015 TO 2595 AVAILABLE BUT NOT RECORDED.

	6/11/86
2595' 1/4" long APPRox.	2917' 1/2" LONG APPROX.
<u>2623' 1/2" " "</u>	2934' 1"
2632' 1/4" "	3015' 1"
2642' 1/4"	3021' 1/2"
2644' 3/8" '	3058' 5/8
2651' 1/4" ··· ETC	3070' 1/4
2665' 1cm square	3093' 5/8
2673' 1 1/2cm square	3112' 1/2
2681' Scrap	3114' 1/2
2682' 1/2"	3156' 3/4cm square
2686' Scrap	3175' 3/4cm square
2697' 1/4"	3178' 3/8"
2703' 1cm square	3235' 5/8
2712' Powder	3276' 1/2
2720' Scrap	3318' 3/8
2726' Scrap	3339' 1cm square
2726' Scrap	3365' 3/8
2734' Scrap	3367 ' 1"
2742' Scrap	3403' 3/8
2749' Scrap	3433' 1/2
2766' 1/4" Scrap	3435' 1 1/2"
2786' Powder	3526' Scrap
2791' 3/4cm square	3608' 1"
2844' 1cm	
2885' 5/8"	3690' 1"

GAS ANALYSIS RESULTS

CORE LABORATORIES AUSTRALIA (QLD.) LTD. Poge 1 of 2

Petroleum Reservoir Engineering

PERTH, AUSTRALIA

PERTH OFFICE: P.O. BOX 163 NEDLANDS WESTERN AUSTRALIA 6000 CABLE: CORFLAR TELEPHONES: B6 4319 69 2160 TELEX: AAP3415 BRISBANE OFFICE: P.O. BOX 111 ALBION CABLE: CORELAB TELEPHONE: 52 3222

BASIC DATA

COMPANY:	SHELL DEVELOPMENT (AUSTRALIA) PTY. LTD.	Page l
WELL:	SOLE NO. 1	Date <u>11 May 1973</u>
		File AP3-GA4
SAMPLE:	M-4 F.I.T. NO. 5	

GAS ANALYSIS RESULTS

COMPONENT	MOL %	
METHANE	96.09	
ETHANE	1.54	
PROPANE	0.11	
I-BUTANE	0.01	
N-BUTANE	NIL	
I-PENTANE	NIL	
N-PENTANE	NIL	
HEXANES +	NIL	
CARBON DIOXIDE	1.52	
OXYGEN	0.01	
NITROGEN	0.72	
HYDROGEN SULFIDE	NIL	
	100.00	

Calculated Gas Gravity = 0.5796 (AIR = 1)

Calculated Gross Heating Value = 1002 BTU per cubic foot of dry gas at 14.7 P.S.I.A. and 60° F.

CORE LABORATORIES AUSTRALIA (QLD.) LTD.

Petroleum Reservoir Engineering

PERTH, AUSTRALIA

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PERTH OFFICE: P.O. BOX 163 NEDLANDS WESTERN AUSTRALIA 6009 CABLE: CORELAB TELEPHONES: 86 4319 69 2160 TELEX: AA93415

e 5

BRISBANE OFFICE: P.O. BOX 111 ALBION CABLE: CORELAB TELEPHONE: 52 3222

242.

COMPANY:	SHELL DEVELOPMENT (AUSTRALIA) PTY. LTD.	Page 1
WELL:	SOLE NO. 1	Date ll May 1973
SAMPLE:	B-25 F. I. T. NO. 7	File: AP3-GA3

GAS ANALYSIS RESULTS

COMPONENT	MOL %	
METHANE	96.07	
ETHANE	1.51	
PROPANE	0.14	
I-BUTANE	0.01	
N-BUTANE	NIL	
I-PENTANE	NIL	
N-PENTANE	NIL	
HEXANES +	NIL	
CARBON DIOXIDE	0.79	
OXYGEN	0.03	
NITROGEN	1.45	
HYDROGEN SULFIDE	NIL	
	100.00	

Calculated Gas Gravity = 0.5762 (AIR = 1) Calculated Gross Heating Value = 1002 BTU per cubic foot of dry gas at 14.7 P.S.I.A. and 60° F.

PETROPHYSICAL EVALUATION



Interval 2,657-2,800 ft.

Results: Net pay 50 ft., gas bearing, see fig. 1 Average porosity = 33.5%, range 28-38% Average water saturation = 29% Gas/water contact at 2716 ft.

Logs available

Date	Log type	Run	Interval
5/2/73	IES/SP	2	3,709-2,190
5/2/73	FDC/CNL/GR	2	3,708-2,190
5/2/73	BHCSL/SP	2	3,706-2,190
6/2/73	MLL/ML	1	3,703-2,190

Method of Evaluation

Porosity

The sonic log was not used as it is very much influenced by hydrocarbons in the pay zone. Calibration of FDC and CNL in a waterbearing section from 3,300'-2,760' indicates a matrix density of 2.71 gr/cm^3 , which was confirmed by grain density measurements on cuttings.

The GR-curve is apparently not a good indicator of shaliness as indicated by the CNL-FDC and analysis of sidewall samples.

The CNL porosity in the gas bearing zone was corrected to equivalent SNPporosity using Schlumberger chart CP-9. Equivalent SNP-porosity and density were used to find the porosity corrected for hydrocarbons (Chart CP.6).

Water Salinity

Cross plots of RMLL versus porosity and RIL versus porosity (see fig. 2) indicate an m-factor of 2.1 and a water resistivity of 0.09 \mathbf{A} m at BHT (53,000 ppm NaC1).

<u>Water Saturation -</u>

A value of n = 2 was used.

Induction log readings were used uncorrected, as the laterolog failed.

A gas/water contact is present at 2,716'. The interval 2,716'-2,739' still shows a small resistivity anomaly, and is thought to contain some residual hydrocarbons.

Hydrocarbon density

Through the hydrocarbon bearing interval the average CNL-porosity is approximately 20 porosity units lower than the FDC-porosity, indicating the whole interval to be gas bearing.

This was confirmed by formation interval tests. See appendix 7 for FIT test reports and appendix 4 for a gas analysis.



	1				
DEPTH	Ø CNL	P FDC	ø	RMLL	RIL
3300	31	2.16	31.5	5.0	1.39
3233	30	2.23	29	6.2	1.25
3220	26	2.29	25	5.0	2.45
3155	33	2.20	31.5	4.2	1.25
3145	26	2.29	25	5.0	1.47
3108	24	2.34	23	4.7	2.00
3060	39	2.08	38	2.6	0.71
3033	23	2.26	25	6.0	1.20
3005	29	2.26	27.5	6.0	1.08
2970	28	2.28	26.5	7.0	1.09
2947	27	2.20	28.5	4.6	1.05
2927	26	2.27	26	6.0	1.39
2917	25	2.23	26.5	6.0	1.43
2905	. 39	2.07	38	2.3	0.71
2885	36	2.13	35	3.8	0.77
2805	36	2.11	35.5	5.6	1.00
2798	24	2.23	26	9.0	1.43
2790	36	2.06	37	2.9	0.71
2762	36	2.08	36.5	3.6	0.79
	9	ł .	1		a ŝ

CALIBRATION IN WATER ZONE





PETROPHYSICAL DATA SHEET SOLE NO. 1

INTERVAL	Ø CNL	م FDC	ØFDC	ØSNP eq.	ø derived	RIL	Ro	SW
2657-2661	31	2.22	28.5	n.a.	30	4.0	1.14	54
2661-2666	10	1.96	44	17.5	35	13.0	0.82	25
2669–2676	1	1.90	47.5	11	34	40.0	0.87	15
2678-2682	3	1.96	44	12	32	15.0	1.00	26
2684–2691	13	2.10	35	18	30	190.0	1.14	. 8
2693-2695	19	1.99	42	24	35	90.0	0.82	10
2695-2699	15	2.13	34	19	29	15.0	1.22	28
2699 – 2705	20	2.02	40.5	24.5	35	8.8	0.82	31
2705-2710	28	2.05	38.5	30	36	5.0	0.78	40
2710-2716	32	2.03	40	33.5	38	2.7	0.69	51
2716-2739	39	2.06	38	n.a.	38.5	1.25	0.67	73
2739–2765	39	2.07	37.5	n.a.	38	0.83	0.69	91
2765–2787	37.5	2.12	34.5	n.a.	36	0.91	0.78	92
2787-2794	_ 36	2.06	38	n.a.	37	0.71	0.74	100
2794–2800	27	2.22	28.5	n.a.	28	.1.42	1.32	96

GAS BEARING INTERVAL

PE90`5091

This is an enclosure indicator page. The enclosure PE905091 is enclosed within the container PE905086 at this location in this document.

The enclosure PE905091 has the following characteristics: ITEM_BARCODE = PE905091 CONTAINER_BARCODE = PE905086 NAME = Petrophysical Evaluation Interval BASIN = GIPPSLAND PERMIT = VIC/P9 TYPE = WELLSUBTYPE = WELL_LOG DESCRIPTION = Petrophysical Evaluation Gasbearing Interval for Sole-1 REMARKS = DATE_CREATED = DATE_RECEIVED = W_NO = W666 WELL_NAME = SOLE-1 CONTRACTOR = CLIENT_OP_CO = SHELL AUSTRALIA (Inserted by DNRE - Vic Govt Mines Dept)

FIT DATA AND REPORT

AGNEW-GO-WESTERN PTY. LTD. 582 St.Kilda Road Melbourne, Victoria 3004

BASIC

a series a

FEBRUARY 6-7, 1973 SOLE No.1 (WILDCAT)

SHELL DEVELOPMENT AUSTRALIA PTY. LTD.

PSIG

4950

1785.4

PSIG

3300

1785.1

SOLE

PURPOSE: OSTAIN SUBSURFACE PRESSURES WITH AMERADA GUAGES RUN IN TANDEM WITH SCHLUMBERGER FORMATION INTERVAL TESTER.

TOOLS USED: AMERADA 3300 PSI ELEMENT SERIAL NO. 15630-N 12 HOUR CLOCK AMERADA 4950 PSI ELEMENT SERIAL NO. 6556-N 12 HOUR CLOCK

F.I.T. TEST No. 1 @ 3160'

HOURS

REMARKS Hydrostatic Seal failed — Mud Run

F.I.T. TEST No. 2 @ 3160'

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PSIG PSIG	
<u>4950</u> <u>3300</u>	REMARKS
1787.9 1785.1	
	FORMATION TIGHT. FIRE SHAPED
	CHARGE INTO SEGREGATOR.
478.2 466.2	PRESSURE RESULTING FROM CHARGE

F.I.T. TEST No.3 @ 2728'

HOURS	PSIG 4950	PS1G 3300	REMARKS	
	1542.5	1542.8	HYDROSTATIC Seal Failure - Mud Run	
		<u> </u>	I.T. TEST No.4 @ 2727!	
HOURS	PSIG 4950	PS1G 3300	REMARKS	
	1540.0	1538.7	HYDROSTATIC	

SEAL FAILURE - MUD RUN

AGNEW-GO-WESTERN PTY. LTD. 582 ST.KILDA ROAD MELBOURNE, VICTORIA 3004

SHELL DEVELOPMENT AUSTRALIA PTY. LTD.

行。這些認識

SOLE

SOLE No. 1 (WILDCAT) February 7, 1973

TANDEM	SUBSURFACE PRESSURES WITH AMERADA WITH Schlumberger Formation Inter	VAL TESTER.
TOOLS USED: AMERADA Amerada Maximum Temperature:	3300 PSI ELEMENT SERIAL NO. 156 4950 PSI ELEMENT SERIAL NO. 655	30 N 12 HOUR CLOCK 6 N 12 HOUR CLOCK

F.I.T. TEST NO.5 @ 2673'

H B <u>R</u> <u>S</u> 0413	PSIG <u>3300</u> 1508.1	PS1G 4950 1510.2	<u>REMARKS</u> Hydrostatic
0415 0416 0418 0420	1174.9	1173.1 1175.6	OPEN MAIN CHAMBER AND SET TOOL
			SAMPLING PRESSURE
0442 0444 0446 0448 0450	1174.9 1188.3 1200.2 1201.92	1175.6 1180.7 1185.5 1205.3 1207.8	
A.5A			SHUT IN PRESSURE
0458 0459	1201.92 215	1207.8 220.7	SHUT MAIN CHANBER Open Segregator Either blocked or a
0507	215	220.7	TIGHT TEST
0508 0509	1198.5	1202.9	SHOOT SHAPED CHARGE
0515	1198.5	1202.9	SEGREGATOR NOT FULL SO NOT TRUE FORMATION PRESSURE Seal segregator
		F.l.	T. TEST No. 6 @ 2791'
HOURS	PSIG 3300	PSIG 4950	REMARKS
	1571.0	1572.4	HYDROSTATIC Seal Failure - Mud Run

AGNEW-GO-WESTERN PTY. LTD. 582 St.Kilda Road Melbourne, Victoria 3004

SHELL DEVELOPMENT AUSTRALIA PTY. LTD.

SOLE

FEBRUARY 7, 1973 SOLE NO.1 (WILDCAT)

PURPOSE: OBTAIN SUBSURFACE PRESSURES WITH AMERADA GUAGES RUN IN TANDEM WITH SCHLUMBERGER FORMATION INTERVAL TESTER.

TOOLS USED: AMERADA 3300 PSI ELEMENT SERIAL NO. 15630 N 12 HOUR CLOCK AMERADA 4950 PSI ELEMENT SERIAL NO. 6556 N 12 HOUR CLOCK

F.I.T. TEST No. 7 @ 2695"

<u>HOURS</u> 1435	PS1G 3300 1520	PSIG 4950 1522.6	REMARKS Hydrostatic
1440 1442 1444 1446 1448 1450	1121.9 1144 1159.4 1166.2 1167.9 1169.6	1121.1 1158.3 1168.2 1170.6 1170.6 1175.6	OPEN MAIN CHAMBER AND SET TOOL
1504 1506 1508 1510	1171.3 1176.4 1188.3 1201.9	1175.6 1180.6 1205.3 1207.8	SAMPLING PRESSURE Shut in pressure
1514 1516	1201.9 1201.9	1207.8 1207.8	SEAL MAIN CHAMBER AND OPEN SEGREGATOR
1518 1520 1524	1201.9 1203.6 1203.6	1207.8 1212.8 1212.8	SAMPLING PRESSURE Shut in pressure Seal segregator

F.I.T TEST No. 8 @ 2728'

PSIG	PSIG		
HOURS 3300	4950 F	REMARKS	
affind Constitution		<u> </u>	
1535.3	1537.5	VDROSTATIC	
		FAL FALLIDE	



GORMA: K. GRAPH PAPERS CHRISTCHURCH N.Z.

No 0423 Log-log, 2% cycles x 2 cycles

INTERPRETATIVE

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2

ONCESSION: VIC./P9	,		
	DATE: 6/2/73 DEPTH: 3160)	
EST OBJECTIVE/CONCLUSION	OBE FORMATION	<u>_ 11.001 =</u> 11. Sub. 288	090
		ŊġĸĸĸĸĸŎŎĸŎġĸŎġĊĸĊĬĊŎŎŎŎĊŎĊŎĊŎŎŎŎŎĊŎĊŎĊŎŎŎĊŎŎŎŎŎŎŎŎŎŎ	an of a state of a state of a state of the
1. HOLE AND MUD DATA	2. TOOL DATA	3. SAMPLING	DATA
ole size (nominal) $\frac{97}{8}$	Tester type	Charges installed <u>1 x</u>	<u>- 78" SC</u> .
(caliper) <u>10</u>	Gun block <u>COMBO</u>	Open Port installed	********
eviation (test depth)o ud type LIGNOSULPHONATE	Pad type <u>SOFT</u> Spacer shoe <u>3</u> ins.	Flowline valve fitted	ΙΔ Τ.
eight <u>10.7</u> Ibs/gal	Pressure gauge 2000 psig		
iscosity 46 sec. Marsh	Sample chamber $6_{gel} = 22_{e}10$	65cc	•
PI fluid loss (30 min.) <u>3.8</u> cc il content 7 %	Choke size <u>0.030</u> ins. Depth control <u>GR</u>	· .	
hloride content 5200 ppm	Copin control and the Set and the set		
•		· * .	
4. TEST DETAILS	5. P.	RESSURES MEASURED	
N - 1 - 1 - 1 - 1 - 1 - 1 - 20		Amerada A Amerada B	Mean (A&B)
Fool in hole17.30Fool Set17.33		psig psig psig	prig
Flowline open 17.34	Final Build-up Pr psig	psig psig	peig
fool free <u>17.46</u>	Closed-in Prpsig	psigpsig	psig
	Mud Pressure <u>1750</u> psig	<u>1785</u> psig <u>1785</u> psig	1785 psig
	6. 8	ECOVERY	
	č.	2587 AUCTORNING STRATED	
	a) Oil/condensate I	PourpointOF, Grav	· · ·
alculated fill-up mins.	b) Water/filtrate	Salinity ppm Weight10.7 lbs/c	
bserved fill-up mins.	d) Solids	Weight <u>10.7</u> Ibs/c Description	U.IT.
ax. temp. recorded OF	e) Total a + b + c + d I		* *
	f) Formation gas I		
pening pressure psig pening temperature OF	g) Explosion gas (. h) Total gas i		6 2
	, , , , , , , , , , , , , , , , , , ,	Carbon dioxide	70
7. <u>PVT DATA</u>	• 8. G	AS SAMPLES TAKEN	
Final sampling conditions)			•••••••
= vols/vol	A. Chamber pressure psig	Sample pressure	_ psig
o = vols/vol	Chamber pressure psig	Sampla pressura	
s = vols/vol	Chamber pressure psig	Sample pressure	_psig
9. FILL CALCULATION	10. <u>C</u>	THER RESULTS	•
Solution gas (atmospheric conditions), axR	• •	vol/vol =	
Free gas (atmospheric conditions), h-i	= Condensate Ra		
Free gas 🖕 (final sampling conditions), j/	Permeability	$FDC-CNL \log = 24$	- mD
Oil/condensate (final sampling cond.), axB	c = Porosity (from c = Formation Pre		. %
) Non-hydrocarbons e-a	=+ Productivity Ir		
Total fill	=	!	
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Sevention (text dropth) 1.0 Space shoe SUPT Flowing value fitted We type LifeNONATE (wight) 10.7 thutch.th Firmsure page 2000 psig Firing order used Hitte Tecosity 46 see. Marth Sample chamber 6, gal < 22,1				•
Pressure sups				
iscosity 46 esc. Marki Sample chamber 6psi = 22_1 65 c c PPI fluid ios (30 min.) 3.8 ion Development Development 4. TEST DETAILS 5. PRESSURES MEASURED Tool in hole 20.43 Initial Flowing Prprig Amerada A Amerada A Amerada A Open Flowline 20.44 Initial Flowing Prprig			Firing order used <u>REVERSE</u>	••••••••••••••••••••••••••••••••••••••
P! Huid tos (30 min.) 3.8 cc Depth control 02.020 ins. Depth control 02 Name 32.8 cc Depth control 02 A. TEST DETAILS 5. PRESSURES MEASURED Dool in hole 20.43 Totol in hole 20.44 Final Buildup Pr. prig Pire Sample Shot 20.44 Final Buildup Pr. prig Pire Sample Shot 20.58 Cool free 21.07 Bate disample 21.06 Mud Presure 1785 prig Dool free 21.07 Bate disated fillup mins. Bolids 200cc Bate means 1 Premeting resure prig Bate means 00 Bate means 10 Premeting resure prig Big presure prig Deprig 0 Exploriting greature Prot Data A. Chambar presure Solids 50cc Solids 50cc Solids 50cc <td></td> <td></td> <td>6</td> <td>· .</td>			6	· .
il content			566	
4 IEST DETAILS 5. PRESSURES MEASURED Cool in hole 20.43 Initial Flowing Pr prig p	lil content%			•
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Schlumbergar Ameradia A Amerada B Mean (A&B) Schlumbergar Ameradia A Amerada B Mean (A&B) Tool in bole 20.44 Final Buildoup Pr				
Cool in hole 20.43 Initial Flowing Pr prig prig	4. LEDI DE FAILS		ESSURES MEASURED	
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Pire Sample Shot 20.58 Closed-in Pr.	Performance of the second second second second second second second second second second second second second s			
Sealed Sample 21.06 Mud Pressure 1740 psig 1785 psig 1785 psig 1786_5 psig Pool free 21.07 6. RECOVERY 6. RECOVERY • OAp; atculated fillup	Fire Sample Shot 20.58	Closed-in Prpsig	psig psig psig	
B. <u>RECOVERY</u> alculated fill-up		Mud Pressure <u>1740</u> psig <u>1</u>		•
al Oil/condensate 1 Pourpoint OF, Gravity OAPi bit vater/filtrate 200cc 1 Salinity pom Cr bit vater/filtrate 200cc 1 Weight 10.7 Itstatx (xx ga 1) bit vater/filtrate 200cc 1 Weight 10.7 Itstatx (xx ga 1) bit vater/filtrate 200cc 1 Weight 10.7 Itstatx (xx ga 1) bit vater/filtrate 200cc 1 Weight 10.7 Itstatx (xx ga 1) bit vater/filtrate 0 Total s + b + c + d 250cc 1 Description SAND pening temperature psig 1 Formation gas 1 Explosion gas 1 pening temperature or	1001 IFee 21.07	· · · · · · · · · · · · · · · · · · ·	201/201/	
b) Water/filtrate		6. <u>R</u> E	COVERY	
b) Water/filtrete Part C' _		a) Oil/condensate	PourpointOF, Gravity OAP	14
beeved fillup		200-	Salinity pom Cl	•
iax. temp. recorded 110 oF e) Total a + b + c + d 250cc i i ipening pressure psig g) Explosion gas i i pening temperature oF h) Total gas i Carbon dioxide% 7. PVT DATA 8. GAS SAMPLES TAKEN Final sampling conditions) a. Chamber pressure psig Sample pressure psig a = vols/vol A. Chamber pressure psig Sample pressure psig a = vols/vol Chamber pressure psig Sample pressure psig a = vols/vol Chamber pressure psig Sample pressure psig 9. FILL CALCULATION 10. OTHER RESULTS Solution gas (atmospheric conditions), axRs = GOR, f/a = vol/vol = cu.ft/bbit Free gas (atmospheric conditions), b.i = Permeability = mOD b) Free gas a (final sampling cond.), axBg = Formation Pressure = psig c) Vicondensate (final sampling cond.), axBg = Formation Pressure = psig d) Non-hydrocarbons e.e =		0/ 1/100	COL	
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=		8. <u>G</u> A	10 JANITLES IAKEN	
o =				
s =vols/vol Chamber pressurepsig Sample pressurepsig 9. <u>FILL CALCULATION</u> 10. <u>OTHER RESULTS</u> Solution gas (atmospheric conditions), axR _s =GOR, f/a =vol/vol =cu.ft/bbi Free gas (atmospheric conditions), h-i =GOR, f/a =vol/vol =cu.ft/bbi Permeability =mD Porosity (from <u>FDC-CNI</u> ₄₀₀) =24 % Oil/condensate (final sampling cond.), axB ₀ =Formation Pressure =psig Non-hydrocarbons e-a = <u>250cc</u> + Productivity Index =b/d/gei Total fill = <u>250cc</u> (for 1.1. ft. %uof 22.2 1 = EMARKS: <u>FORMATION APPARENTLY IMPERMEABLE</u> PETROLEUM ENGINEER				: .
9. <u>FILL CALCULATION</u> 10. <u>OTHER RESULTS</u> Solution gas (atmospheric conditions), axR ₃ = GOR, f/a = vol/vol = cu.ft/bbi Free gas (atmospheric conditions), h-i = GOR, f/a = vol/vol = cu.ft/bbi Pree gas (atmospheric conditions), h-i = GOR, f/a = vol/vol = cu.ft/bbi Pree gas (atmospheric conditions), h-i = GOR, f/a = vol/vol = cu.ft/bbi Pree gas (atmospheric conditions), h-i = GOR, f/a = vol/vol = cu.ft/bbi Pree gas (atmospheric conditions), h-i = GOR, f/a = vol/vol = cu.ft/bbi Oil/condensate (final sampling cond.), axB ₀ = Permeability = mD Oil/condensate (final sampling cond.), axB ₀ = Formation Pressure = psig INon-hydrocerbons e-a =250cc Productivity Index =	-			<u>،</u> ،
Solution gas (atmospheric conditions), axR _s = GOR, f/a = vol/vol = cu.ft/bb/ Free gas (atmospheric conditions), h-i = Condensate Ratio from set (final sampling conditions), j/E = Permeability for mfDC=CN1(og) =24 % Oil/condensate (final sampling cond.), axB ₀ = Porosity (from fDC=CN1(og) =24 % Oil/condensate (final sampling cond.), axB ₀ = Productivity Index = Osig) Non-hydrocarbons from set = 250cc + Productivity Index = Osig Total fill =250cc (for 1.1. ft.) EMARKS:FORMATION APPARENTLY IMPERMEABLE // for 1.1. ft.) PETROLEUM ENGINEER	-	hold		ş
Free gas (atmospheric conditions), h-i = Condensate Ratio F bbl/MMSCF Permeability = mD mD Porosity (from FDC-CNI409) = 24 % Oil/condensate (final sampling cond.), axB0 = Formation Pressure = psig Non-hydrocarbons e-a = 250cc + Productivity Index = bbl/dimesion %of 22.2 j = 1	9. FILL CALCULATION	10. <u>01</u>	THER RESULTS	
Free gas (final sampling conditions), j/E = Permeability = mD Oil/condensate (final sampling cond.), axBo = Porosity (from FDC-CNI tog) = 24 % Oil/condensate (final sampling cond.), axBo = Formation Pressure = peig Non-hydrocarbons e-a = 250cc Productivity Index = peig Total fill = 250cc (for 1.1. fr b/6/pei % of 22.2 1 = 1 EMARKS: FORMATION APPARENTLY IMPERMEABLE PETROLEUM ENGINEER * *				
Free gas (final sampling conditions), j/E = Porosity (from FDC-CNI tog) =24 % Oil/condensate (final sampling cond.), axBo = Formation Pressure = psig Non-hydrocarbons e-a =250cc Productivity Index = psig Total fill =1 for 1.1. ft. for 1.1. ft. % of 22.2 j = PETROLEUM ENGINEER	Free gas (atmospheric conditions), h-i		io · F bbl/MMSCF	
Oil/condensate (final sampling cond.), axB ₀ = Formation Pressure = psig Non-hydrocarbons	Free gas (final sampling conditions) U	E - Banada (C - H	PDC-CNL	
Total fill = 250cc (for I.I. ft. % of 22.2] = 1 EMARKS: FORMATION APPARENTLY IMPERMEABLE	Oil/condensate (final sampling cond.). axB	Company Forosity (from ±		
Total fill = 250cc (for I.I. ft. % of 22.2] = 1 EMARKS: FORMATION APPARENTLY IMPERMEABLE) Non-hydrocarbons 8-a	= <u>250cc</u> + Productivity Ind		
EMARKS:FORMATION APPARENTLY IMPERMEABLE	Total fill	= <u>250cc</u> (for 1.1. ft.		
PETROLEUM ENGINEER	% of 22.2	I = <u>1</u>		
PETROLEUM ENGINEER	EMARKS: FORMATION APPARENT	LY IMPERMEABLE		
PETROLEUM ENGINEER			anan anti-anti-anti-to materiala a dalamani materiala amparatati anti-anti-anti-anti-anti-anti-anti-anti-	
PETROLEUM ENGINEER		۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ - ۲۰۰۶ -		uwo
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	SCHLUMBERG	ER WIRELINE F	ORMATION T	EST FINAL RE	PORT	
	CONCESSION: VIC/P9					
	CONCESSION: VIC/P9 WELL:Sole-1_TEST NO. 3	6/2/7	3 55551.27	28 40 10 15 10	273 60 Cub 400	er m ett
				<u>20</u> ft.bor ==	<u></u>	080
	TEST OBJECTIVE/CONCLUSIONLAT	ROBE FORMAT	ION		1999 - L. august - Spin of application approximation applied by	
	1. HOLE AND MUD DATA	2. <u>TOO</u>	LDATA		3. SAMPLING	DATA
	Hole size (nominal)	Tester type	FIT	Charges in	nstalled1_x	Zu SC
	(caliper) <u>11</u>	Gun block	COMBO			
	Deviation (test depth)0	Pad type	SOFT	verse · · · · · ·		an an anna a suite an an anna an anna ann anna anna
	Mud type LIGNOSULPHONATE		<u>3</u> in <u>2000</u> ps		ter used <u>REVE</u>	lse
	Weight <u>10.7</u> lbs/ gal Viscosity <u>46</u> sec. Marsh	Pressure gauge Sample chamber _				
and the second sec	API fluid loss (30 min.) 3.8 cc		.030 in			• ; •
	Oil content %	Depth control	GR			
•	Chloride content5200 ppm					
		· · ·	-		CACUPER	
	4. TEST DETAILS			PRESSURES M		
	Tool in hole 23.10	Initial Flowing Pr	Schlumberger	Amerada A <u>1540</u> psig	Amerada B <u>1539</u> psig	Mean (A&B) <u>1539</u> psig
	Tool in hole23.10Open Flowline23.15	Final Flowing Pr.		psig	psig	psig
	Tool set 23.16	Final Build-up Pr		psig	psig	paig
	Segr. Open 23.31	Closed-in Pr.	1440. psig	psig	p3+g	psig
	Sealed Sample 23.36	Mud Pressure	1500_psig	psig	psig	0213
	Tool Free 23.37		c	PECOVERY		
			ίΩ.	. RECOVERY		
		a) Oil/condensate	3	I Pourpoir	ntOF, Gra	NityOAPI
		b) Water/filtrate		I Salinity	ppr	
	Calculated fill-up mins.	c) Mud	<u>22.000 cc</u>		10.5 ibs	lcu.ft.
	Observed fill-up mins. Max. temp. recorded OF	d) Solids	<u> </u>		ion <u>SAND</u>	
•	Wax. temp. recorded	f) Formation gas				
	Opening pressure 800 psig	g) Explosion gas				
	Opening temperature 100 °F	h) Total gas	Cong. 4 (11) (14)	_ I Carbon	dioxide	%
	7. PVT DATA			B. GAS SAMPLE	TAKEN	
	(Final sampling conditions)					
	E = vols/vol B ₀ = vols/vol		suro (-	pressure	•••
	$R_s = $ vols/vol	· •	sure		pressure	
	3			· •		
	9. FILL CALCULATION		1	0. OTHER RESU	LTS	
	i) Solution gas (atmospheric conditions), ax	R _s =	GOR, f/a =	= vol/	vol =	cu.ft/bbi
	j) Free gas (atmospheric conditions), h-i	=			F	
	k) Free gas 🖕 (final sampling conditions), j	15	Permeabili Permeabili	•	= g) = <u></u> 38	
	 i) Oil/condensate (final sampling cond.), ax 					
	m) Non-hydrocarbons e-a	•				
	Total fill		(for I.I. f	it.		
	% of 22.2	$2_1 = 100$			•	
	REMARKS: SEAL FAILURE					•
	REMARKS: OILIN TITLBOIL					ar werden van gegenergelen aan de de de aan de daaren a
			· · · · · · · · · · · · · · · · · · ·			
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			PETROLEUM	•		
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	د المحمد معالمه و بالمحمد الذي عند الدورة الذي سيتين وكان المحمد المحمد المحمد (1994 - 1995) . التي	w 1. ·				

SCHLUMBERGER WIRELINE FORMATION TEST FINAL REPORT CONCESSION: VIC/P9 7/2/73 DEPTH: 2727 ft.bdf = 2272 ft. Sub. seabed WELL: Sole-1 TEST NO. 4 DATE:___ TEST OBJECTIVE/CONCLUSION LATROBE FORMATION 1. HOLE AND MUD DATA 2. TOOL DATA 3. SAMPLING DATA 98 Charges installed $\frac{1}{1} \times \frac{7}{8}$ SC FIT Hole size (nominal) Tester type COMBO (caliper) Gun block Open Port installed Flowline valve fitted _ 1 0 SOFT Deviation (test depth) <u>1</u> o Mud type <u>LIGNOSULPHONATE</u> Pad type REVERSE 3 Firing order used Spacer shoe ins. 5000 10.7 Weight lbs/cu.ft. Pressure gauge Osic API fluid loss (30 min.) 3.8 cc 6 gal = 22,165 Sample chamber. المراجع مراجع والالتراجي والمراجع 0.020 Choke size ... ins. \mathbf{GR} Oil content _ % Depth control Chloride content _____5200 _ pom 4. TEST DETAILS 5. PRESSURES MEASURED Schlumberger Amerada A Amerada B Mean (A&B) 1540 psig 1539 peig 1539 psig Tool in hole 02.00 Initial Flowing Pr. 1375 psig Flowline open 02.03 Final Flowing Pr. ____ psig _____ osig ____ psig -- prig 02.04 Tool Set Final Build-up Pr. ____ psig ____ psia _____ DSID Daig 02.07 Tool free psiy Closed in Pr. _ psig psig pain pain 1375 psig Mud Pressure _ psig _ psig 0810 6. RECOVERY OAPI a) Oil/condensate Pourpoint ____OF, Gravity __ 1 Salinity / ppm Cl⁺ b) Water/filtrate 11 Description _____Ibs/cu.ft. 22.000 cc Calculated fill-up____ mins c) Mud 50 cc + _____ mins. Observed fill-up d) Solids 0F Max. temp. recorded ____ e) Total a + b + c + d ____ 4 f) Formation gas Opening pressure _____ psig g) Explosion gas Opening temperature _____ OF h) Total gas Carbon dioxide 7. PVT DATA 8. GAS SAMPLES TAKEN (Final sampling conditions) **e** 🚽 ____ vols/vol A. Chamber pressure _____ psig Sample pressure OSIC Bo vols/vol Sample pressure _____psig Chamber pressure _____ psig Rs ; = vols/vol Chamber pressure Sample pressure __ psig __ psig 9. FILL CALCULATION 10. OTHER RESULTS i) Solution gas (atmospheric conditions), $axR_s = -$ GOR, f/a = _____ vol/vol = _____ cu.ft/bbl j) Free gas (atmospheric conditions), h-i =____ Condensate Ratio F _____ bbl/MMSCF Permeability mD k) Free gas , (final sampling conditions), j/E = Porosity (fromFDC-CNL log) = ____38___ % 1) Oll/condensate (final sampling cond.), ax80 =_____ Formation Pressure OSIG 0-a == _____ m) Non-hydrocarbons Productivity Index * _ h/d/pei Total fill (for l.f. ft. ່ 🖛 _ %of LOST SEAL REMARKS: __

PETROLEUM ENGINEER

amenaal

SCHLUMBERGER WIRELINE FORMATION TEST FINAL REPORT

	VIC/P9	

WELL: SOLE-1_ TEST NO. . 5 DATE: 7/2/73 DEPTH: 2673 ft.bdf = 2218 ft. Sub. seebed TEST OBJECTIVE/CONCLUSION LATROBE FORMATION/GAS BEARING

1. HOLE AN		ATA
Hole size (nominal) _ (caliper) _	97	
Deviation (test depth) _ Mud type <u>LIGNOS</u>		
Weight <u>10.7</u>		bs/gal.
Viscosity <u>46</u> API fluid loss (30 min.)		
Oil content Chloride content	<u>–</u> 5200	%

2. <u>TO</u>	OL DATA		
Tester type	FIT		Ch
Gun block	COMBO	<u>.</u>	Op
Pad type	SOFT		Flo
Spacer shoe	3	ins.	Fir
Pressure gauge	2000	_ psig	
Sample chamber	<u>6 gal =</u>	22.165	cc
Choke size		ins.	199 j.

Schlumberger

. psig

.200

1.200

1750

1750

1

+ d

1500 psig

pth control_ GR

Closed-in Pr.

Mud Pressure

a) Oil/condensate

b) Water/filtrate

e) Total a + b + c

f) Formation gas g) Explosion gas

h) Total gas

c) Mud

d) Solids

Initial Flowing Pr. 1350 psig

Final Flowing Pr. 1350 psig

Final Build up Pr. 1350 psig

ppm

3. SAMPLING DATA HTF - SCCharges installed Open Port installed Flowline valve fitted . REVERSE Firing order used .

5. PRESSURES MEASURED

Pourpoint _

Description

Salinity

Weight _

8. GAS SAMPLES TAKEN

Amerada B

1173 psig

1176 psig

1208 psig

1510 psig

10.6

Carbon dioxide 5000+

. psig

- OF, Gravity

ppm Cl

Ibs/gal

ppm

Mean (A&B)

1174 paig

1175 psig

1205 psig

1509 psig

_ paig

-_OAPI

Amereda A

1175_psig

1175 nsig

1202 psig

_____ psig 1508 • psig

6. RECOVERY

4. TEST DETAILS

Chloride content _

4.10	
4.15	
4.16	
4.59	
5.08	
5.15	
5.16	
	4.15 4.16 4.59 5.08 5.15

Calculated fill-up 39	mins.
Observed fill-up 33?	mins.
Max. temp. recorded 110	OF
Opening pressure <u>1070</u>	psig
Opening temperature <u>100</u>	^o F

PVT DATA

*

**

REMARKS:

(Fi	nal	sam	plin	g ca	ondi	tions	1:

$E = \frac{75}{vols/vol}$ $B_{0} = \frac{vols/vol}{vols/vol}$ $R_{s} = \frac{vols/vol}{vols/vol}$	A. Chamber pressure Chamber pressure Chamber pressure	psig	Sample pressure Sample pressure Sample pressure		psig
9. FILL CALCULATION		10. <u>OTHE</u>	RESULTS		
 i) Solution gas (atmospheric conditions), axR_s j) Free gas (atmospheric conditions), h-i 	10000	GOR, f/a = Condensate Ratio	· F		cu.ft/bbi bbi/MMSCF
k) Free gas , (final sampling conditions), j/E	=	Permeability Porosity (from <u>CNL</u>		*	mD %
1) Oil/condensate (final sampling cond.), axB ₀ m) Non-hydrocarbons e-a	4	Formation Pressure Productivity Index		1205	psig D/d/psi

24.5 **Total fill** % of 22.2 1 = 111 %

USED MONEL SEGREGATOR NO. M4. FLOWLINE PROBABLY PARTIALLY BLOCKED. FLOWING PRESSURE NOT INDICATIVE OF FORMATION PERMEABILITY. HAD TO USE SHAPED CHARGE TO FILL SEGREGATOR.

(for 1.1. ft.

PETROLEUM ENGINEER germenad

Viscosity 46 sec. Marsh Sample chamber6gal = 22 API fluid toss (30 min.) 3:8 cc Choke size4 x 0.020 iii Oil content		• • • • • • • • • • • • • • • • • • •
TEST OBJECTIVE/CONCLUSION LATROBE FORMATION 1. HOLE AND MUD DATA (caliper) 2. TOOL DATA (caliper) 2. TOOL DATA Tester type Hole size (nominal) $9\frac{1}{8}$ Gun block COMBO (caliper) Deviation (test depth) 1 0 Pad type SOFT Mud type LIGNOSULPHONATE Spacer shoe 3 in Weight 10.7 lbs/cu.ft. Pressure gauge 5000 pp API fluid loss (30 min.) 3.8 cc Choke size 4 x 0.020 in Viscosity 46 sec. Marsh Sample chamber 6 gal = 22 Oil content 7 % Depth control GR Depth control GR Tool 1 in hole 7.10 Initial Flowing Pr. psig psig Final Flowing Pr. psig Tool Set		
Image: construct the product of th	791_ft.bdf =2336	5_ ft. Sub. sesbed
1. HOLE AND MUD DATA 2. TOOL DATA Hole size (nominal) $9\frac{7}{4}$ Tester type FIT (caliper) 114 Gun block $COMBO$ Deviation (test depth) 1 o Pad type $SOFT$ Mud type LIGNOSULPHONATE Spacer shoe 3 in Weight 10.7 lbs/cu.ft. Sample chamber 6 gal = 22 Viscosity 46 sec. Markh Sample chamber 6 gal = 22 Oil content — — % Choke size 4 x 0.0220 in Oil content — — % Choke size 4 x 0.0220 in Yincoli content 5200 ppm Persure gauge 5000 perth control GR Pool in hole 7.10 Initial Flowing Pr. psig psig Final Build-up Pr. psig Flowline open 7.15 Final Build-up Pr. psig Fool Set 7.18 Oiserved fill-up mins. ol Solids 50 c Observed fill-up mins. ol Solids 50 c ol Sol		
Hole size (nominal) $9\frac{4}{5}$ Tester type FIT (caliper) $11\frac{1}{4}$ Gun block $COMBO$ Deviation (test depth) 1 0 Pad type $SOFT$ Mud type LIGNOSULPHONATE Spacer shoe 3 in Weight 10.7 Ibs/cu.ft. Pressure gauge 5000 p Viscosity 46 sec. Marsh Sample chamber 6 gal = 22 Oil content — % Depth control GR Depth control GR Obloride content 5200 ppm 4 TEST DETAILS Schlumberger Final Flowing Pr. psig Final Flowing Pr. psig psig Fool 1 in hole 7.10 Final Build-up Pr. psig Flowline open 7.15 Final Build-up Pr. psig Fool 1 Free 7.18 Closed-in Pr. psig Colesed-in Pr.		
Hole size (nominal) $9\frac{4}{2}$ Tester type FIT (caliper) $11\frac{1}{4}$ Gun block $COMBO$ Deviation (test depth) 1 0 Pad type $SOFT$ Mud type LIGNOSULPHONATE Spacer shoe 3 in Weight 10.7 Ibs/cu.ft. Pressure gauge 5000 p Viscosity 46 sec. Marsh Sample chamber 6 gal = 22 API fluid loss (30 min.) 3° .8 cc Obeth control GR Depth control GR Oil content - % Depth control GR Schlumberger Initial Flowing Pr. psig Final Build-up Pr. psig psig Fool Set 7.16 Closed-in Pr. psig Fool Free 7.18 Closed-in Pr. psig Color. Free of of 50 c Mud Pressure 1525 psig Mud Pressure 0 Observed fill-up mins. of Solids 50 c Max. temp. recorded of of of for at b b c t	3	L SAMPLING DATA
(caliper) $11\frac{1}{4}$ Gun block COMBO Deviation (test depth) 1 o Pad type SOFT Mud type LIGNOSULPHONATE Spacer shoe 3 in Weight 10.7 Ibs/cu.ft. Pressure gauge 5000 p Viscosity 46 sec. Marsh Sample chamber 6 gal = 22 API fluid toss (30 min.) 3:8 cc Choke size 4 x 0.020 in Oil content - % Depth control GR Depth control GR Chorde content 5200 ppm 4 TEST DETAILS Schlumberger Cool 1 in hole 7.10 Initial Flowing Pr. psig psig Plowline open 7.15 Final Build-up Pr. psig Cool Set	Charges installe	1 III CO
Deviation (test depth) 1 o Pad type SOFT Mud type LIGNOSULPHONATE Spacer shoe 3 iii Weight 10.7 Ibs/cu.ft. Pressure gauge 5000 p Viscosity 46 sec. Marsh Sample chamber 6 gal = 22 API fluid loss (30 min.) 3.8 cc Choke size 4 x 0.020 ii Oil content 9 9 Mud type Schlumberger Choke size 4 x 0.020 ii Oil content 5200 ppm 4 TEST DETAILS Schlumberger Schlumberger Fool Set 7.16 Initial Flowing Pr. psig psig Final Build-up Pr. psig Fool Free 7.18 Closed-in Pr. psig mis. 0 Oil/condensate		alled
Construction (rest oppin) Pressure gauge 3 ist Wuid type LIGNOSULPHONATE Spacer shoe 3 ist Weight 10.7 Ibs/cu.ft. Spacer shoe 3 ist Viscosity 46 sec. Marsh Smalle chamber 6 gal = 22 API fluid loss (30 min.) 3.8 cc Choke size 4 0.020 ist Oil content 7 % Depth control GR Depth control GR Chloride content 5200 ppm Pressure gauge 5000 pressure gauge 5000 pressure gauge 22.000 model optic state pressure gauge 50 fill Depth control GR GR GR GR GR GR Depth control GR GR <td></td> <td></td>		
Weight	Flowline valve	DENTEDOD
Weight	· · · · · · · · · · · · · · · · · · ·	60
API fluid loss (30 min.) $3 \cdot 8$ cc Choke size 4×0.020 is Oil content - % Depth control GR Oil content 5200 ppm Ppm Ppth control GR 4. TEST DETAILS Schlumberger Initial Flowing Pr. psig Pool in hole 7.10 Initial Flowing Pr. psig Pool Set 7.16 Final Build-up Pr. psig Pool Free 7.18 Closed-in Pr. psig Pool Free 7.18 Closed-in Pr. psig Mud Pressure 1525 psig Mud Pressure 1525 psig Max temp. recorded OF o) Total a + b + c + d f) Formation gas Opening pressure psig g) Explosion gas g) Explosion gas Opening temperature OF h) Total gas Chamber pressure Chamber pressure Rs = vols/vol A. Chamber pressure Chamber pressure Chamber pressure	sig 165 cc	와 이상이 있다. 이상 이상 이상 이상 지수는 것은 것은 것은 것은 것은 것은 것은 것이 있다.
Childrids (content		
Different	ns.	a and a second second second second second second second second second second second second second second secon
4 TEST DETAILS Schlumberger Pool in hole 7.10 Initial Flowing Pr. psig Plowline open 7.15 Final Flowing Pr. psig Pool Set 7.16 Final Build-up Pr. psig Pool Free 7.18 Closed-in Pr. psig Pool Free 7.18 Closed-in Pr. psig Mud Pressure 1525 psig Mud Pressure 1525 psig Observed fill-up mins. Observed fill-up mins. Out Max. temp. recorded OF OF OF Out 22.000 c Opening pressure psig Solids 50 c 0 Opening temperature OF Nud 22.000 c 0 Opening temperature OF Nud Solids 50 c Opening temperature OF Notal a + b + c + d 1 Final sampling conditions) E Notal gas Chamber pressure Chamber pressure Bo = vols/vol A. Chamber pressure Chamber pressure Chamber pressure Chamber pressure Chamber pressure Chamber pressure	*****	
Schlumberger Pool in hole 7.10 Plowline open 7.15 Pool Set 7.16 Pool Free 7.16 Pool Free 7.18 Closed-in Pr. psig Mud Pressure 1525 psig Mud Pressure 1520 c Bool Served fill-up mins. Opening pressure oF Opening pressure psig Opening temperature oF PVT DATA (Final sampling conditions) E	in a start and a start of the s	
Schlumberger Pool in hole 7.10 Plowline open 7.15 Pool Set 7.16 Pool Free 7.16 Pool Free 7.18 Closed-in Pr. psig Mud Pressure 1525 psig Mud Pressure 1520 c Bool Served fill-up mins. Opening pressure oF Opening pressure psig Opening temperature oF PVT DATA (Final sampling conditions) E		
lool in hole7.10Initial Flowing Pr.psig'lowline open7.15Final Flowing Pr.psig'ool Set7.16Final Build-up Pr.psig'ool Free7.18Closed-in Pr.psig'ool Free7.18Mud Pressure1525 psig'ool free7.18Oil/condensate'ool freemins.·'ool free0·'ool fill-upmins.·'ool stee0·'ool fill-upmins.·'ool stee0·'ool fill-upmins.·'ool fill-upmins.·'ool fill-upmins.·'ool fill-upof·'ool fill-upof·'ool fill-upof·'ool fill-upof·'ool fill-upof·'ool fill-upof·'ool fill-up··'ool fill-up··'ool fill-up··'ool fill-up··'ool fill-up··'ool fill-up··'ool fill-up·<	6. PRESSURES MEASL	JRED
Plowline open 7.15 Final Flowing Pr. psig Pool Set 7.16 Final Build-up Pr. psig Pool Free 7.18 Closed-in Pr. psig Mud Pressure 1525 psig Mud Pressure 1525 psig All Cil/condensate		erada B Mean (A&B)
Plowline open 7.15 Final Flowing Pr. psig fool Set 7.16 Final Build-up Pr. psig fool Free 7.18 Closed-in Pr. psig Mud Pressure 1525 psig Mud Pressure 1525 psig a) Gil/condensate		psig psig
ool Set 7.16 Final Build-up Pr.psigool Free 7.18 Closed-in Pr.psigMud Pressure 1525 psigMud Pressure 1525 psiga) Gil/condensateb) Water/filtrateclosed-in Prb) Water/filtratec) Mud 22.000 cObserved fill-upmins.c) Mud 22.000 cObserved fill-upmins.d) Solids 50 cMax. temp. recorded ^{o}F e) Total a + b + c + df) Formation gasOpening pressurepsigg) Explosion gasOpening temperature ^{o}F h) Total gas7. PVT DATA(Final sampling conditions)E=Bo=wols/volA. Chamber pressureRs=wols/volChamber pressure	nsig	psig psig
Mud Pressure 1525 psig a) Gil/condensate	psig	psig psig
a) Cil/condensate b) Water/filtrate b) Water/filtrate calculated fill-up mins. c) Mud 22.000 c Observed fill-up mins. d) Solids Max. temp. recorded or Popening pressure psig g) Explosion gas Opening temperature or r. PVT DATA (Final sampling conditions) E Bo miss. vols/vol Rs		psig psig
a) Gil/condensate b) Water/filtrate b) Water/filtrate c) Mud 22.000 c Observed fill-up mins. c) Mud 22.000 c Max. temp. recorded or or e) Total a + b + c + d f) Formation gas f) Formation gas Opening pressure psig opening temperature or or f) Total gas 7. PVT DATA (Final sampling conditions) E vols/vol Bo vols/vol Rs vols/vol Chamber pressure c	_1571 psig 15	72 psig 1572 psig
a) Gil/condensate b) Water/filtrate b) Water/filtrate c) Mud 22.000 c Observed fill-up mins. c) Mud 22.000 c Max. temp. recorded OF oF e) Total a + b + c + d f) Formation gas Opening pressure psig oF h) Total gas Opening temperature oF f. PVT DATA (Final sampling conditions) E		
Calculated fill-up mins. b) Water/filtrate Observed fill-up mins. c) Mud 22.000 c Max. temp. recorded oF e) Total a + b + c + d 50 c Max. temp. recorded oF e) Total a + b + c + d 50 c Opening pressure psig g) Explosion gas 50 c Opening temperature oF h) Total gas 50 c 7. PVT DATA (Final sampling conditions) A. Chamber pressure $$ B _o = vols/vol A. Chamber pressure $$ R _s = vols/vol Chamber pressure $$	6. RECOVERY	
Calculated fill-up mins. b) Water/filtrate Observed fill-up mins. c) Mud 22.000 c Max. temp. recorded oF e) Total a + b + c + d 50 c Max. temp. recorded oF e) Total a + b + c + d 50 c Opening pressure psig g) Explosion gas 50 c Opening temperature oF h) Total gas 50 c 7. PVT DATA (Final sampling conditions) A. Chamber pressure $$ B _o = vols/vol A. Chamber pressure $$ R _s = vols/vol Chamber pressure $$		
Calculated fill-up mins. c) Mud $22,000$ c Observed fill-up mins. d) Solids 50 c Max. temp. recorded °F e) Total a + b + c + d f) Opening pressure psig g) Explosion gas	I Pourpoint	OF, GravityOAP
Observed fill-up mins. d) Solids 50 c Max. temp. recorded °F e) Total a + b + c + d f) Max. temp. recorded psig g) Explosion gas g) Opening pressure °F h) Total gas g) Opening temperature °F h) Total gas g) 7. PVT DATA (Final sampling conditions) A. Chamber pressure g) Bo		ppm Cl
Observed fill-up mins. d) Solids20 c Max. temp. recorded0F e) Total a + b + c + d Max. temp. recorded0F e) Total a + b + c + d Opening pressure psig g) Explosion gas Opening temperature0F h) Total gas 7. <u>PVT DATA</u> (Final sampling conditions) E vols/vol A. Chamber pressure Bo = vols/vol Chamber pressure Rs = vols/vol Chamber pressure		•7 1bs/cu.ft.
f) Formation gas Opening pressure psig g) Explosion gas Opening temperature OF h) Total gas 7. PVT DATA (Final sampling conditions) E	C + Description _	SAND
Opening pressure psig g) Explosion gas Opening temperature °F h) Total gas 7. PVT DATA (Final sampling conditions) E vols/vol A. Chamber pressure B ₀ = vols/vol Chamber pressure R _s = vols/vol Chamber pressure	<u> </u>	· · · · · · · · · · · · · · · · · · ·
Opening temperature °F h) Total gas 7. <u>PVT DATA</u> (Final sampling conditions) E		
7. <u>PVT DATA</u> (Final sampling conditions) E =	1+	
(Final sampling conditions) E	I Carbon dioxic	de%
(Final sampling conditions) E = vols/vol A. Chamber pressure B ₀ = vols/vol Chamber pressure R _s = vols/vol Chamber pressure		and the second second second second second second second second second second second second second second secon
(Final sampling conditions) E	8. GAS SAMPLES TAK	(EN
E = vols/vol A. Chamber pressure B _o = vols/vol Chamber pressure R _s = vols/vol Chamber pressure	. A DE LA DE LA DELLA DE LA DELLA DE LA DELLA	
B ₀ = vols/vol Chamber pressure R _s = vols/vol Chamber pressure		
R _s = vols/vol Chamber pressure	psig Sample pressu	irepsig
	psig Sample pressu	ure psig
	psig Sample pressu	ire psig
9. FILL CALCULATION 1	0. OTHER RESULTS	
i) Solution gas (atmospheric conditions), axRs = GOR, f/a	= vol/vol =	cu.ft/bbl
 Free gas (atmospheric conditions), h-i = Condensat 	VUI/VUI	63.17/001

0

40

%

psig

b/d/psi

ર ેવ

36

=

k) Free gas , (final sampling conditions), J/E = I) Oli/condensate (final sampling cond.), axBo m) Non-hydrocarbons 0-8 **Total fill** %of

- 1 -

REMARKS:

Productivity Index (for 1.1. ft. 1=_ SEAL FAILURE

PETROLEUM ENGINEER

A in

Porosity (from FDC-CNL fog)

Formation Pressure

IELL DEVELOPMENT (AUSTRALIA) PTY LTD

SCHLUMBERGER WIRELINE FORMATION TEST FINAL REPORT

CONCESSION:

WELL:	SOLE -1	TEST	NO.	7	

TEST OBJECTIVE/CONCLUSION

____ DEPTH: 2695_ft.bdf = ______ ft. Sub. seture LATROBE FORMATION/GAS BEARING

Hole size (nominal)	AND MUD DATA 97
(caliper)	11
Deviation (test depth Mud type LIGNOS) <u>1</u> o SULPHONATE
Weight 10.7	lbs/gal
	6 sec. Marsh
API fluid loss (30 mil	n.) <u>3.8</u> cc
Oil content	- %
Chloride content	5200

4. TEST DETAILS

Tool in hole	14.34
Tool open	14.35
Tool set	14.36
Sealed Chamber	15.12
Sealed Segr.	15.22
Tool Free	15.24

Calculated fill-up 39	
Calculated fill-up 39 Observed fill-up 28	mins.
Max. temp. recorded 110°F	0F
Opening pressure 1000	

100 Opening temperature OF

	7. <u>PVT (</u>	DATA	
(Final sam	pling cond	ditions)	
6		70	vols/vol
B _o = _	1		vols/vol

S. 15.	 . 	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -						· .
A. 1	÷.	X 4 4	- · · ·		1 C A	د نسخه	-	
33.	- F		CAL	_LU	1 A	TF.	T	N
	-						-	

I) Solution gas (atmospheric conditions), axRs =_		
i) Free gas (atmospheric conditions), h-i =	1640	
	•	
k) Free gas 🖕 (final sampling conditions), J/E = _	23.40	
1) Oil/condensate (final sampling cond.), axBo =_	1976 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 -	
m) Non-hydrocarbons	1.45	

vols/vol

Total fill 22

USED SEGREGATOR No.

%of

2. <u>TO</u>	OL DATA		
Tester type	FIT		Charges
Gun block	COMBO		Open Po
Pad type	SOFT		Flowline
Spacer shoe	3	ins.	Firing or
Pressure gauge	5000	psig	· in mig of
Sample chamber	6 gal =	22,165	cc
Choke size <u>4 x</u>		ins.	

GR Depth control.

_ DATE: 7/2/73

S	chlumberger
Initial Flowing Pr.	
Final Flowing Pr.	1060 psig
Final Build-up Pr.	1100 psig
Closed-in Pr.	1100 psig
Mud Pressure	1370 psig

	EASURED	
ərger	Amerada A	Amerada B
) psig	1144_psig	1158
) psig	1176_ osig	1181
psig	1202 psig	1208
psig	1204_psig	1213

	· •24,		en (
sig	11	1	Ĵ.5	1	psi	g
sig	1		8			
sig			20			
sig		1	20	8_	psi	٥
sig			52			
				1, 1 - 3		τ.

3. SAMPLING DATA

· · · · ·

REVERSE

Charges installed HTF-SC

Open Port installed Flowline valve fitted

Firing order used

6. RECOVERY

1520° psig

a) Oil/condensate		÷
b) Water/filtrate		
c) Mud	1.400	
d) Solids	0,050	+ .
e) Total a + b + c	+ d 1.450	•
f) Formation gas	1640	•
g) Explosion gas		4
h) Total gas	1640	

A. Chamber pressure 1000

Chamber pressure

Chamber pressure

24.85

112%

SFA-B25

Pourpoint	0F	Gravit	្ត្	-	0,	NP1
Salinity		 ppm C	1.00	<u>_</u>		
Weight	10.6	 lbs/cu.	ft.			
Descriptio	SAND					

_ D

Carbon dioxide _5000+

1523

8. GAS SAMPLES TAKEN *

Sam	ole pressu	re O	psig
	ble pressu		psig
Samj	ble pressu	re	psig

10. OTHER RESULTS

psig

psig

psig

GOR, f/a = vol/vol =		cu.ft/bbl
Condensate Ratio		DOMMASCE
Permeability	ca 3	Cm
Porosity (from FDC-CNLing) =	32%	¥.
Formation Pressure =	1.208	Osid
Productivity Index =		b/d/mi
(for 1.1. ft.		~

REMARKS:

1997. N

PETROLEUM ENGINEER C am ma

Rage 1 of 1 . >

SCHLUMBERGER WIRELINE FORMATION TEST FINAL REPORT

CONCESSION: VIC/P9

WELL: Sole-1 TEST NO. 8 DATE: 7/2/73 DEPTH: 2728 ft.bdf = 2273 ft. Sub. #abed TEST OBJECTIVE/CONCLUSION LATROBE FORMATION

	UD DATA	2. <u>TOOL</u>	Contracting distributions			3. SAMPLINI	CONSISTING OF THE PARTY OF THE
	$\frac{9\frac{7}{8}}{11}$	reacti type	FIT		Charges install	d 1 x d	r" SC
(destribution)	11		COMBO		Open Port inst		
Deviation (test depth)		Pad type	SOFT	· · · · · ·	Flowline valve		
Mud type LIGNOSULPH		Spacer shoe		ins.	Firing order u	sed <u>REVEN</u>	ISE
Weight 10.7	lbs/gal	Tiessone gauge		psig .			
Viscosity 40	sec. Marsh	Sample chamber	$\frac{6}{2} \operatorname{gal} = \frac{22}{2}$	2105		n an an tao an	
API fluid loss 130 min.)	A. 1998.	Choke size 4 x	0.020	ins.			
Oil content	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Depth control <u>GR</u>					
Chloride content 5200	ppm						
A TECT DETAIL							and the second second second second second second second second second second second second second second second
4. TEST DETAIL	. .		• . •		SURES MEAS		
	40.00		lumberger		rada A 🛛 Am		Mean (A&I
Trailancingsource	18.37	Initial Flowing Pr	· · ·	153	5_ psig 15	37_psig	1536
	18.41	Final Flowing Pr		<u></u>	nsig	psig	
	18.42	Final Build-up Pr.	psig		psig	psig	
Tool free	18.46	Closed-in Pr.	psig		psig	psig	ا سمیتینیو
		Mud Pressure	1500 psig		psig	psig	استنعم
			1		•		
				6. REC	OVERY		
an an an an an an an an an an an an an a							
	17. j 19.	a) Oll/condensate		I	Pourpoint	OF, Gra	wity
		b) Water/filtrate	22,100 0	1	Salinity1	0 7 ppr	
Calculated fill-up		c) Mud			Weight 1		_/ gal
Maxotemp. recorded		d) Solids e) Total a t-b t c			Description .		
		f) Formation gas	та.				
Opening pressure	ncin	g) Explosion gas	······		• · · ·		
Opening temperature	and the second second second second second second second second second second second second second second second	h) Total gas			Carbon dioxi	da .	02
		11, 19,61,803	· · ·	•	Carbon Gloxie	JG	70
7. <u>PVT DATA</u>				8. GAS	SAMPLES TAN	(FN	
			•	-	Construction of the second second		
(Final sampling conditions)					ੀ ਨੇ ਦੀ ਸ਼ੁਰੀ ਕਿ ਕਿ		
E		A. Chamber pressur	8	psig	Sample press	ire	psig
-B _o ≠		Chamber pressur	0	psig	Sample press	Jre	psig
R _s =	vols/vol	Chamber pressur	0	psig	Sample press	ire	psig
		• • • • • • • • • • • • • • • • • • • •	•				
9. FILL CALCU	LATION	•	•	10. <u>OTH</u>	ER RESULTS		
i) Solution gas (atmosphere	ric conditions), ax	R _s =	GOR, f/a	=	vol/vol =		cu.ft/bbi
j) Free gas (atmospheric conditions), h-i =		Condensa	te Ratio	F		bbijMMSC	
			Permeabil		==		m0
k) Free gas 🔒 (final samp			Porosity (from FI	C-CNLog) =	38	%
1) Oil/condensate (final sa	mpling cond.), axi	B _o =	Formatio	n Prossu	e		peig
m) Non-hydrocarbons	0-0		+ Productiv	ity Inde	< ===		
	Total fill	nage d anning Glasperlage discourse after editor of the original states in a super the super	(for 1.1.	Ft.			
	%ot	1=		-	•		
24 - 영화학원 2014년 1월 27 - 17 17 18 19 19 19 19 19 19 19 19 19 19 19 19 19							
د مد د مصدحت در این د تشوری دارد از ۱۹۸۸ د							1. S.
REMARKS: SEAL	FAILURE			-		بالماري بوطونيا بورو (۲۰ مارورو م	

PETROLEUM ENGINEER

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WELL VELOCITY SURVEY REPORT
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WELL VELOCITY SURVEY

of

SOLE No.1

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FOR

•....

SHELL DEVELOPMENT (AUSTRALIA) PTY. LTD.

by

AUSTRAL UNITED GEOPHYSICAL PTY, LTD,

Party 86



2/14

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- 1. Well Information
- 2. Operations
- 3. Computing
- 4. Results of Velocity Survey

<u>Figures</u>

- 1. Location Map
- 2. Amplifier Frequency Response Curves

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- 3. Gas Gun Location Plat
- 4. Computation Diagram Reduced Records of Velocity Survey

<u>Appendix</u>

A Time-Depth Plot (Plate 1) B Velocity Function Plot (Plate 2) C Computation Sheet



Bend

- 1 -

WELL INFORMATION

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NAME OF WELL DATE OF SURVEY

م جو میر

LOCATION

- CO-ORDINATES

ELEVATION K.B, ELEVATION G.L. ELEVATION DATUM PLANE INTERVAL SURVEYED SEISMOGRAPH PROFILE TOTAL DEPTH CASING SHIP HEADING

RIG

Sole No.1 6th February, 1973 30 miles southeast of Marlo township, Victoria, in offshore permit Vic/P9 Latitude 38° 07' 00" S. Longitude 149° 02' 05" E. + 32.0 feet M.S.L. - 423 feet M.S.L. 1110 feet to 3671 feet below K.B. Shotpoint 10225. Line G69-393 3703 feet below K.B. $10\frac{3}{4}$ " @ 2199 feet below K.B. 239°

Glomar Conception



Fin 2



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1. 日本部分にある

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OPERATIONS

1.	Recording Equipment		
	Well geophone		Geospace wall lock velocity geophone (6 X 4.5 hertz detectors)
	Cable 500	. 14	Schlumberger cable and reel
	Reference and Time Break Hydrophones		Marsh Marine MP3
×.	Camera	•	Electro Tech Model ER62
-	Amplifiers		Geospace Model III
2.	Amplifier Specifications		
	Geospace Model III		
	Frequency Response :		Within 3db attenuation from 5 to 300 hertz
	Input Signal Range : '		From 1 microvolt to 300 millivolts R.M.S.
	Input Impedance :		500 ohms
-	Noise :		0,1 microvolts R,M.S, broad band from 10 to 300 hertz (200 ohms source impedance)
3.	Energy: Source		- WL
	Gas Gun		4.24 cubic feet capacity
			(Propane Oxygen mixture)
	Ignition System		United Hi-voltage Detonator Panel
	Gas Control System		United gas fill timer

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- 3 -

Recording Procedure 4, Downhole geophone Amplifier No. 1 Output: Filters: ×*** Amplifier No. 2 Output: Filters: •_ . Amplifier No. 3 Output: Hi-Cut Filters: Lo-Cut

Divided output to traces No.1, No.2 and No.3 Hi-Cut 300 hertz 5 hertz Lo-Cut Moonpool Reference Hydrophone Single output to trace No.5 300 hertz Hi-Cut 5 hertz Lo-Cut Time-Break Hydrophone Single output to trace No.4 300 hertz

5 hertz

Time break to trace No.6 (not amplified)

Operational Statistics 5.

Surveyed Interval Number of horizons surveyed Number of shots per horizon Gun Offset Gun Depth Gas fill time **Observer** Shooter

1110 feet to 3671 feet below K.B. Eight Two to Four 85 feet 40 feet 20 secs, (approx. 2 cubic feet) W.J. Larsen L.D. Moore

8/19

- 4 -

6. Recording Operations

Recording instruments were set up in the "Glomar Conception" air conditioning room, and gas gun equipment on the main deck adjacent to the large crane.

Cables for communications, remote firing and hydrophone signals were connected between recorder and gas gun, and between recorder and logging unit for communications, locking geophone control, and well geophone signals.

The gas gun was lowered 40 feet below sea level on the ship's crane, and charges were detonated by spark plug ignition controlled from the tape drum of the compositing system.

Dual time breaks were recorded on MP3 hydrophones fastened 5 feet from the carburettor.

An additional hydrophone was lowered 10 feet below sea level in the moonpool to record horizontal offset times.

All depth measurements were made using the Schlumberger depth indicator.

Comments

Secure geophone locking within the some face well casing could only be achieved at casing joints.

Where the well geophone had been allowed to slip to a casing joint, new depths were determined by Schlumberger depth indicator and marked signal increase as the cable took up weight.



- 5 -

COMPUTING

1. Datum Plane

Well geophone arrival times were corrected to a sea level datum plane using a reduction velocity of 5000 feet per second,

Velocity survey data was processed in Brisbane by the Scientific and Technical Computing centre,

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2 Record Quality

Records at the 1510 feet and 2098 feet levels were disregarded because of excessive noise from tool slip.

•___

Good quality records were obtained at slightly deeper levels, (1543 feet and 2112 feet K.B.), where the tool locked securely to casing joints.

Records for the eight levels used for computation purposes are of good quality and arrival times are considered reliable.

Times from shots at the same levels are in close agreement.

3. Sonic Calibration

The cumulative correction plot on plate 1 shows sonic log time .003⁵ seconds shorter than seismic time at 3639 feet, from the reference point at 1078 feet where sonic and seismic times were tied.



10/19

- 6 -

4. Function Computation

The velocity function was computed by the Nash Miller method, using the following expressions and information from the plot of vertical time against depth.

$$a = \frac{4.605}{t_1} \log 10 \left(\frac{Z_1 - Z_2}{Z_2}\right)$$

$$Vd = \frac{aZ_1}{e^{at_1} - 1}$$

1

 Z_1 and t_1 are corresponding depth and one way time at a deeper point in the section, and Z_2 is the depth corresponding to one way time of $\frac{t_1}{2}$ secs.

This function was computed with respect to a sea level datum plane.

RESULTS

1. Horizon Arrival Times

Average times were used to plot the time depth curve, the arrival times to the principal horizons are as follows:

HORIZON	DEPTH BELOW DATUM (0 ft. M.S.L.)	ARRIVAL TIMES (one way times)
Latrobe Valley Fm	2626 '	0.401_ secs
Strzelecki Fm	3323'	0,486 ⁵ secs



- 7 -

RESULTS (Contd)

2. Velocity Function

The function V= 5475 + 0.86 computed for Sole No.1, is a close fit to the time depth curve from datum to total depth.

3. Function Plots

A plot of the above function is included in the appendix of this report for comparison purposes,

Respectfully submitted

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Austral United Geophysical Pty. Ltd. Party 86

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AUSTRAL UNITED GEOPHYSICAL P/L.

Fig-4

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WELL VELOCITY DETERMINATION		
SHELL DEVELOPMENT AUSTRALIA PTY LTD		1 m
WELL		
Shot Hole Na	╪┼┼┼┽┽┼┼╤╪┼┼╤╪╪┼╤╪╪┼╤╪╪┼╤╪╪┼╤╪┼┾╤┼╤┿╤┼╤┿┿┿╗┙┢┉╖╖╋╬╢╹┝┿┉╬┙╢╤┼╤╪╪╪╪╪╪	╺┿╃┿╋┿┽┥
Depth of Well Seismometer Below Kelly Bushing11_10'		
Below Dotum 00/r. (A.S.L1078' Charge 20. SecDepth of Shot40'		http:
		-+++++
		INI
WELL VELOCITY DETERMINATION		IIM
SHELL DEVELOPMENT AUSTRALIA PTY. LTD.		1114
Record No		[]]]]]
other & Buntup Depth of Well Solamometer		
Below Kelly Bushing1110' Below Datum 00H: (A.S.L.L 1 0 78'		
Charge. 20 880 Depth of Shot		
WELL VELOCITY DETERMINATION		
SHELL DEVELOPMENT AUSTRALIA PTY. LTD		
WELSOLEN# 1		r###
Shor Hole NoAF	╪┿╪╪╪╪╪┿┿┿┿╪┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿	H+++++
Depth of Well Seismonster Below Kelly Bushing1122'		
Below Dohum 00H. (A.S.L1090'	ᡶ᠋᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁᠁	
WELL VELOCITY DETERMINATION	· · · · · · · · · · · · · · · · · · ·	WM
SHELL DEVELOPMENT AUSTRALIA PTY. LTD.		
Record No33		
Shat Hole NoA.G Cate & teame Deputs of Well Selamameter		
Below Kelly Bushing		
Chorge_20_SBCDepth of Shot40.		
		<u> </u>
WELL VELOCITY DETERMINATION		
SHELL DEVELOPMENT AUSTRALIA PTY. LTD		
WELL_SQLE_NS.I.	┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼	++++++
Record No	┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼	
Depth of Well Selemonater Below Kethy Bushing	<u>╇╒┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍┍</u> ┍┍┍┍┍	++++++
Below Dorum Offr (ASL) . 1090'		+++++
Charge 20186 Depth of Shor 40'		$\{\{1,1\},\dots,1\}$
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Eller van Techt ^e um	nie w zaje na zaje na služi pre slovenskom na konstruktura slove do la na na na na slovenskom slovenskom slove	15/10	
	WELL VELOCITY DETERMINATION		
	SHELL DEVELOPMENT AUSTRALIA PTY. LTD.		
	Shar Hale NoAL Ofwers & Sweep Deprih of Well Selemanneter Belane Kathy Bushing1122'		
	Balow Darwin 2014, IA SLI 1090' Chorge <u>20</u> SEC Depth of Shor		<mark>┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿┿</mark>
	WELL VELOCITY DETERMINATION		MMMMM
	SHELL DEVELOPMENT AUSTRALIA PTY LTD.		
	Shar Hele No		
	Before Conum CONK (ASLI1511'		
-	WELL VELOCITY DETERMINATION		MMMM
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	Shar Haja Na		
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	SHELL DEVELOPMENT AUSTRALIA. PTY.LTD. wei SOLE heard Ne 28 Stat Hole Ne AB		
	Oter & human Depond of Weill Satemanneter Berlow Kelly Bushing1543' Below Donum 00H. U.S.LL1511' Overge 2.0. SBSDepint of Stret40'	$=== \mathbf{s}^{\mathbf{s}} $	
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Below Kelly Bushing3037'		
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	Overge 2.0. 585. Depth of Stor. 40'						
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19/19 WELL VELOCITY DETERMINATION SHELL DEVELOPMENT AUSTRALIA.PTY.LTD. WEI SOLE NET Shor He Office & 1 elly Bushing_____36.71'____ A m 00th (A.S.L)_____ 36 3.9' MIH hummun M 40' 20 sec. Deputs of Shore וויין Π • WELL VELOCITY DETERMINATION SHELL DEVELOPMENT AUSTRALIA . PTY. LTD. SOLE Nº 1 ______ _K__ Shor Hole No of Well Seiem arge 20 \$85 Depth of Shot ____4.0 ____ ____ ШŢ

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EVALUATION

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DEPARTMENT OF M B-2-2. NATIONAL RESOURCES NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

IN CONFIDENCE

BMR RECORD 1980/8

SOLE FIELD - Gippsland Basin, Victoria:

Estimated Recoverable Petroleum Reserves

as at 1 January 1980

DУ

L.E. Kurylowicz

The information contained in this report has been obtained by the Department of National Resources as part of the policy of the Australian Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

1.1 Sheet No..... 1/3/74 SOLE STRUCTURE ROCK VOLUME QUANTITY EST - Ref ASED DWG Nº 1579/0P/3 Scale 1:50,000 2500 CONTOUR = :0092 × 186 59 uno = :0092 × 186 × 400 anes = 685 anes: aux 2600' CONTOUR Area = 3,160 acres au 85-8 2678 CONTOUR (GWC) ana = 6,760 ans ÷ G.W.C Roch wolume (approx) = 100 (685-+3160) + 78 (3160 + 6460) = 192000 + 375,000 = 567,000 ane feel.

1/3/74 マ SOLE STRUCTURE Net roch volume / gross . .0116 = 340 Billio cuff. Calculation of By when person drops to soo pria, assume at this pressure bellaviour is like an edical gas to assume z=1., tent cond. $B_{g} = \frac{P_{sc}T}{T_{sc}P} = \frac{14.7 \times 570}{520 \times 500} = 0322$ -----Reservoi gas vol en place = 122 Billion ····· Potential recovery ~ 240 Billion luft _____ ······ ------·····

SOLE GAS. Reference Shell well summary report affinds + Comfortion Mole to Mittane 96.09 Ethane 1.57 Propane 0.11 1. Bellane 0.01 N. Bulane 1. Pentane N. Pentane Keranes 1.52 Carbon Desude Crupper 0:01. 0.72 Wetragen H2S 100 % . Calculator SC = 0.5762. FIT Balton hole pressure = #36 prig = 450 pria (suy) Bottom hele temperature = 110°F. = 570°R. Pseudo critical lemperatives & pressures not afflicted Tex = 350 - 1.52 × 0.8 - 0.72 × 2.5 = 347

 $P_{ev} = 670 + 1.52 \times 44 - 0.72 \times 17 = 665$ $P_{ev} = 670 + 1.52 \times 44 - 0.72 \times 17 = 665$ $\frac{T}{T_{ev}} = \frac{570}{347} = 1.65$ $\frac{P}{T_{ev}} = \frac{1222}{665} = 1.83$ $\frac{P}{R_{v}} = \frac{1222}{665} = 1.83$ $Naw B_{g} = \frac{P_{x} ZT}{T_{w} P} = \frac{14.7 \times 0.8P5 \times 570}{5^{2}0 \times 1222} = .0116$

affendix 6. Interval 2657 - 2706' (59' goos) Wet pay 50' - ges bearing avera water saturation - 29%. Gas / water contact at 2716 fr.

This is an enclosure indicator page. The enclosure PE905087 is enclosed within the container PE905086 at this location in this document.

The enclosure PE905087 has the following characteristics: ITEM_BARCODE = PE905087	
CONTAINER_BARCODE = PE905086	
NAME = Prospect Map	
BASIN = GIPPSLAND	
PERMIT = VIC/P9	
TYPE = SEISMIC	
SUBTYPE = HRZN_CNTR_MAP	
DESCRIPTION = Prospect Map and Seismic Section, Depth	'n
Contours Horizon Top of Latrobe	
Formation for Sole-1 (pre-drill)	
REMARKS =	
DATE_CREATED = $31/03/72$	
DATE_RECEIVED =	
W_NO = W666	
WELL_NAME = SOLE-1	
CONTRACTOR =	
CLIENT_OP_CO = SHELL AUSTRALIA	
(Inserted by DNRE - Vic Govt Mines Dept)	

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This is an enclosure indicator page. The enclosure PE905088 is enclosed within the container PE905086 at this location in this document.

The onclosure PE905	088 has the following characteristics:
ITEM BARCODE =	-
CONTAINER BARCODE =	
	Time Contour Map
	GIPPSLAND
PERMIT =	VIC/P9
TYPE =	SEISMIC
SUBTYPE =	HRZN_CNTR_MAP
DESCRIPTION =	Unmigrated Time Contour Map of Top
	Latrobe Formation
REMARKS =	
$DATE_CREATED =$	30/09/73
DATE_RECEIVED =	
W_NO =	W666
WELL_NAME =	SOLE-1
CONTRACTOR =	
CLIENT_OP_CO =	SHELL AUSTRALIA
(Incorted by DNPF -	Vic Govt Mines Dept)
(INSELCED DY DIKE -	VIC GOVC MIMES Depc)

This is an enclosure indicator page. The enclosure PE905089 is enclosed within the container PE905086 at this location in this document.

The enclosure PE905089 has the following characteristics: ITEM_BARCODE = PE905089 CONTAINER_BARCODE = PE905086 NAME = Time-Depth Curve BASIN = GIPPSLAND PERMIT = VIC/P9 TYPE = WELLSUBTYPE = VELOCITY_CHART DESCRIPTION = Time-Depth Curve (interpretive) for Sole-1 REMARKS = DATE_CREATED = 6/02/73DATE_RECEIVED = W_NO = W666 WELL_NAME = SOLE-1CONTRACTOR =CLIENT_OP_CO = SHELL AUSTRALIA

This is an enclosure indicator page. The enclosure PE905090 is enclosed within the container PE905086 at this location in this document.

The enclosure PE905090 has the following characteristics: ITEM_BARCODE = PE905090 CONTAINER_BARCODE = PE905086 NAME = FIT Data BASIN = GIPPSLAND PERMIT = VIC/P9TYPE = WELLSUBTYPE = FIT DESCRIPTION = Formation Tester Recovery Data for SOle-1 REMARKS = DATE_CREATED = DATE_RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1 CONTRACTOR = SCHLUMBERGER CLIENT_OP_CO = SHELL AUSTRALIA

This is an enclosure indicator page. The enclosure PE900505 is enclosed within the container PE905086 at this location in this document.

	0505 has the following characteristics:
ITEM_BARCODE =	
CONTAINER_BARCODE =	PE905086
NAME =	Palynological Chart
BASIN =	GIPPSLAND
PERMIT =	VIC/P9
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Palynology Distribution Chart for
	Sole-1
REMARKS =	
DATE_CREATED =	31/05/73
DATE_RECEIVED =	
W_NO =	W666
WELL_NAME =	SOLE-1
CONTRACTOR =	
CLIENT_OP_CO =	SHELL AUSTRALIA
(Inserted by DNRE -	Vic Govt Mines Dept)

This is an enclosure indicator page. The enclosure PE900506 is enclosed within the container PE905086 at this location in this document.

The enclosure PE900506 has the following characteristics: ITEM_BARCODE = PE900506 CONTAINER_BARCODE = PE905086 NAME = Foraminiferal Chart BASIN = GIPPSLAND PERMIT = VIC/P9TYPE = WELLSUBTYPE = DIAGRAM DESCRIPTION = Foraminiferal Distribution and Depositional Environment for Sole-1 REMARKS = DATE_CREATED = 31/05/73DATE_RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1CONTRACTOR =CLIENT_OP_CO = SHELL AUSTRALIA (Inserted by DNRE - Vic Govt Mines Dept)

This is an enclosure indicator page. The enclosure PE603647 is enclosed within the container PE905086 at this location in this document.

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The enclosure PE60	3647 has the following characteristics:
ITEM_BARCODE =	PE603647
CONTAINER_BARCODE =	PE905086
NAME =	Composite Log
BASIN =	GIPPSLAND
PERMIT =	VIC/P9
TYPE =	WELL
SUBTYPE =	COMPOSITE_LOG
DESCRIPTION =	Composite Log for Sole-1
REMARKS =	
DATE_CREATED =	30/04/73
DATE_RECEIVED =	
W_NO =	W666
WELL_NAME =	SOLE-1
CONTRACTOR =	
CLIENT_OP_CO =	SHELL AUSTRALIA
(Inserted by DNRE -	Vic Govt Mines Dept)

This is an enclosure indicator page. The enclosure PE603648 is enclosed within the container PE905086 at this location in this document.

The enclosure PE60 ITEM BARCODE =	3648 has the following characteristics:
CONTAINER BARCODE =	
	Mud Log
	GIPPSLAND
PERMIT =	
 TYPE =	
SUBTYPE =	MUD_LOG
DESCRIPTION =	Mud Log for Sole-1
REMARKS =	
DATE_CREATED =	5/02/73
DATE_RECEIVED =	
W_NO =	W666
WELL_NAME =	SOLE-1
CONTRACTOR =	BAROID
CLIENT_OP_CO =	SHELL AUSTRALIA
(Inserted by DNRE -	Vic Govt Mines Dept)

This is an enclosure indicator page. The enclosure PE603649 is enclosed within the container PE905086 at this location in this document.

The enclosure PE603649 has the following characteristics: ITEM_BARCODE = PE603649 $CONTAINER_BARCODE = PE905086$ NAME = Drill Rate Log, 1 of 5 BASIN = GIPPSLAND PERMIT = VIC/P9 TYPE = WELL SUBTYPE = WELL_LOG DESCRIPTION = Drill Rate Log for Sole-1, 1 of 5. REMARKS = DATE_CREATED = DATE_RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1CONTRACTOR = BAROID CLIENT_OP_CO = SHELL AUSTRALIA

This is an enclosure indicator page. The enclosure PE603650 is enclosed within the container PE905086 at this location in this document.

The enclosure PE603650 has the following characteristics: ITEM_BARCODE = PE603650 CONTAINER_BARCODE = PE905086 NAME = Drill Rate Log, 2 of 5 BASIN = GIPPSLAND PERMIT = VIC/P9 TYPE = WELL SUBTYPE = WELL_LOG DESCRIPTION = Drill Rate Log for Sole-1, 2 of 5. REMARKS = DATE_CREATED = DATE_RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1 CONTRACTOR = BAROID CLIENT_OP_CO = SHELL AUSTRALIA

This is an enclosure indicator page. The enclosure PE603651 is enclosed within the container PE905086 at this location in this document.

The enclosure PE603651 has the following characteristics: ITEM_BARCODE = PE603651 CONTAINER_BARCODE = PE905086 NAME = Drill Rate Log, 3 of 5 BASIN = GIPPSLAND PERMIT = VIC/P9 TYPE = WELLSUBTYPE = WELL_LOG DESCRIPTION = Drill Rate Log for Sole-1, 3 of 5. REMARKS = DATE_CREATED = DATE_RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1CONTRACTOR = BAROID CLIENT_OP_CO = SHELL AUSTRALIA

This is an enclosure indicator page. The enclosure PE603652 is enclosed within the container PE905086 at this location in this document.

The enclosure PE603652 has the following characteristics: ITEM_BARCODE = PE603652 CONTAINER_BARCODE = PE905086 NAME = Drill Rate Log, 4 of 5 BASIN = GIPPSLAND PERMIT = VIC/P9TYPE = WELLSUBTYPE = WELL_LOG DESCRIPTION = Drill Rate Log for Sole-1, 4 of 5. REMARKS = DATE_CREATED = DATE RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1 CONTRACTOR = BAROID CLIENT_OP_CO = SHELL AUSTRALIA

This is an enclosure indicator page. The enclosure PE603653 is enclosed within the container PE905086 at this location in this document.

The enclosure PE603653 has the following characteristics: ITEM_BARCODE = PE603653 CONTAINER_BARCODE = PE905086 NAME = Drill Rate Log, 5 of 5 BASIN = GIPPSLAND PERMIT = VIC/P9 TYPE = WELLSUBTYPE = WELL_LOG DESCRIPTION = Drill Rate Log for Sole-1, 5 of 5. REMARKS = DATE_CREATED = DATE_RECEIVED = $W_NO = W666$ WELL_NAME = SOLE-1CONTRACTOR = BAROID CLIENT_OP_CO = SHELL AUSTRALIA

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This is an enclosure indicator page. The enclosure PE601445 is enclosed within the container PE902342 at this location in this document.

The enclosure PE601445 has the following characteristics: ITEM_BARCODE = PE601445 CONTAINER_BARCODE = PE905086 NAME = Borehole Compensated Sonic Log BASIN = GIPPSLAND PERMIT = TYPE = WELL SUBTYPE = WELL_LOG DESCRIPTION = Borehole Compensated Sonic Log REMARKS = $DATE_CREATED = 5/02/73$ DATE_RECEIVED = W_NO = W666 WELL_NAME = Sole-1 CONTRACTOR = ESSOCLIENT_OP_CO = SHELL

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